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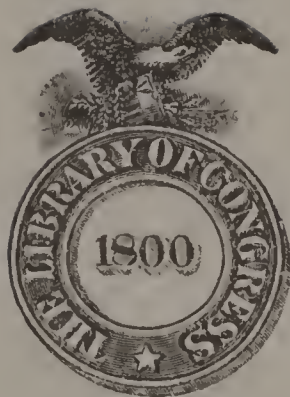
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NOTES ON MEDICAL DIAGNOSIS

FOR
STUDENTS AND PRACTITIONERS
OF
DENTISTRY

BY
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OF
DENTISTRY

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Dedicated by the Author to his Wife
HELEN E. BROWNING

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JUN 11 1924

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P R E F A C E

NOTES ON MEDICAL DIAGNOSIS FOR STUDENTS AND PRACTITIONERS OF DENTISTRY

In 1919 I was invited to give a course of sixteen lectures to the Junior Class of Dentistry of the University of Southern California on the subject of Medical Diagnosis.

The object of the course was to give instruction regarding conditions which would enable them to avoid complications which might arise during their professional duties, recognize disease, the existence or importance of which the patient had not known, and co-operate intelligently with the health authorities and allied officers in the control of communicable diseases, and the promotion of public health work.

The selection and treatment of subjects was left to my judgment.

The consideration of each subject has been from the practical standpoint of usefulness to the dentist. Only the salient points, from this standpoint, have been emphasized in the lectures and more briefly in the notes.

I was unable to find a textbook which appeared to me to have been well adapted for this course. All of the works were so comprehensive that, with the limited time allotted to the subject, details were likely to result in confusion. For this reason brief lecture notes

were mimeographed and distributed to the members of previous classes.

During the preparation of these notes, I consulted many authorities and drew liberally from their writings, using at times extensive quotations when the manner of presentation of the subject was applicable. Memorandums were not made as to the sources of information. These quotations were used or altered in such manner as to adapt them to my use. There was no thought at that time that the notes would appear excepting in mimeographed form; so no effort was made to segregate abstracts and to give credit to the individual authors. It would, at this time, be exceedingly difficult to do so. The following are some of the books which have been most helpful to me, viz.: Medical Diagnosis, Green; Diseases of the Chest and the Principles of Physical Diagnosis, Norris and Landis; General and Dental Pathology, Endelman and Wagoner; Practice of Medicine, Dayton; Modern Medicine, Barker; Forchheimer's Therapeusis of Internal Diseases, and others.

Additions have been made from time to time to the notes. The classes have increased from thirty-four in 1919 to one hundred and sixty-four in 1923-4.

When the question of mimeographing the notes for this year was considered, it was suggested that they be printed and issued in book form.

I express my gratitude for the valuable as-

sistance of Dr. Julio Endelman. It is through my association with him that my interest has been increased and maintained, and the importance of a closer relationship between the dental and medical professions more fully appreciated. Through this association I have had access to his pathological laboratories and profited by his pathological studies. These have been the foundation for clinical work in co-operation with members of the dental profession, which has proven of greatest importance through the care of focal infections, particularly those of the peridental tissues. I am under obligation to him for many helpful suggestions in the preparation of the manuscript and publication of these notes.

I express my appreciation to Dr. Lewis E. Ford, Dean, and Dr. A. C. La Touche, Secretary, of the College of Dentistry of the University of Southern California, for their co-operation and courtesies extended since my affiliation with the College, and to other members of the faculty; also to Dr. Gladys Patric Shachovitch, who rendered valuable assistance in the preparation of the manuscript.

DIAGNOSIS

SCOPE

HISTORY RECORD

HISTORY TAKING

MEDICAL DIAGNOSIS FOR DENTISTS

Scope

Diagnosis, naming disease, means more than naming a disease, and necessitates a knowledge of etiological factors, a correct estimate of the constitutional peculiarities of the patient, the nature and extent of pathological changes, the effect of age, occupation, residence, habits, heredity, past ailments, and even the personal characteristics of the individual.

History-Record

Diagnosis demands a sufficiency of facts, truthfully recorded, intelligently co-ordinated and viewed without pre-conceived prejudice. Every professional man should carefully keep a record of every case and form a habit of reporting those of special interest, the knowledge of which will be helpful to other members of his profession.

History Taking

Knowledge of clinical symptoms in a given case depends either upon (a) history (what is told), or (b) what is seen or determined by the examiner, i.e., (a) subjective symptoms, or (b) objective symptoms. Subjective symptoms depend upon information obtained from the patient, and other persons. These symptoms should be carefully considered in the light of knowledge obtained. If statements are made which seem to be unreasonable, sufficient discussion should occur, that clear understanding may be secured, if possible. It is generally un-

wise to enter into an argument or express disagreement with the history given. Certain single symptoms may name the disease; such are termed pathognomic. Objective symptoms include bacteriological and chemical laboratory tests, and physical signs (physical diagnosis).

Physical Diagnosis consists in employing the senses,—sight, smell, touch and hearing,—to determine the condition of tissues. These may be altered by pathological states as regards density, elasticity or content of fluid or gas. Organs may change size or location. Such changes may be detected by physical signs.

PHYSICAL SIGNS

The outward Signs of Disease

Inspection

First Impressions

General Appearance

Color of Skin

Anaemic Types

Skin in Certain Diseases of the Heart

Cyanosis, Underlying Cause

High Color

Drug Poisoning

General Hyperemia

Jaundice

Obstructive Jaundice

Facial Changes

Nephritis

Baggy Eyelids

Uremia

Syphilis

Moisture of the Skin

Voice.

PHYSICAL SIGNS

The Outward Signs of Disease

INSPECTION

First Impressions The first glance, general appearance, movement, manner of speech or an odor may suggest diagnosis and prognosis.

GENERAL APPEARANCE.

Color of Skin

The colors of the skin most frequently noted are ruddiness, pallor and cyanosis. Anemia is a deficiency in the red cells of the blood, and in the percentage of hemoglobin, or in both. The pale face may or may not mean true anemia, and a high color may co-exist with a low hemoglobin percentage, because of capillary congestion. The color of the mucous membranes is more reliable, and even "rosy chlorotics" usually show pale mucous membranes. Conjunctivae free from congestion, are favorable for observation. The roof of the mouth is frequently a reliable location for observation.

Anemic Types

The color varies markedly in different types of anemia, being greenish-yellow or almost waxy white in pernicious anemia, and a curious earthy tint in the profound secondary anemias of malignant disease, especially of the stomach. A positive diagnosis of the type of anemia can only be made after careful consideration of casual factors and exhaustive laboratory examination.

The pallor of the anemias, aside from those due to rapid blood loss, is gradual and persistent. *Anemic patients recover slowly from operations, and resist infections poorly.*

**Skin in
Certain
Diseases
of the
Heart**

The color in certain forms of heart disease is both interesting and important. Aortic regurgitation is usually associated with a pallor of the indoor-worker type, (bluish white) without true anemia. In compensated regurgitant and obstructive disease of the mitral valve the color is often deceptively high. The skilled eye sees the duskiess of the underlying cyanosis which shows yet more plainly in the mucous membrane of the lips, the skin of the ears, nose, patella, and the nails, whose pink is replaced by a darker hue or in extreme cases by a purplish or black-gray. *These patients withstand shock poorly; are poor anesthetic risks.*

**Cyanosis,
Underlying
Cause**

Cyanosis is a bluish discoloration of the skin, due to imperfect oxidation of the blood. Cyanosis, whether general or local, with or without true dyspnea, ordinarily indicates obstructed venous return, deficient oxidation, or commonly both factors, such as may result from many causes. Some of these which are of more frequent interest to dentists are ordinary suffocation, emphysema, pulmonary fibrosis; obstructed glottis, trachea or bronchi, as from foreign bodies; mediastinal tumors, or other heart and lung lesions. It occurs also in acute disease, such as pneumonia, pleurisy with pneumothorax (air in the pleural cavity) and,

to a slight degree, in severe acute bronchitis. Paralysis and spasm, particularly of the diaphragm, may produce marked cyanosis, as may the inhibition of efficient respiration by severe pain. No outward signs of disease exceed cyanosis in importance, and in its extreme persistent form it is met with most frequently in walking patients in two conditions, i. e., severe emphysema in the adult, congenital heart disease in the child. It is often associated with mere chilling of the body surface, hysteria, neuritis, etc. *The cause of cyanosis should be determined before undertaking an operative procedure.*

High Color

A florid face is common in gout, early interstitial nephritis and hepatic cirrhosis, but may be due to idiosyncrasy, acne rosacea or exposure. It often suggests an over-luxurious and self-indulgent life or the abuse of alcoholics. Unilateral flushing is often observed as a neurosis, in lobar pneumonia on the affected side, and in cases of active pulmonary tuberculosis; it may be due to mere pillow pressure, migraine, and less commonly to irritation of the fibers of the cervical sympathetic, as in aneurysm of the aortic arch.

Poisoning Drug

Local vaso-motor relaxation or paralysis is readily distinguished by the lack of turgidity of the venous trunks, and it should be remembered that certain forms of drug poisoning, especially acetanilid and its congeners, nitrobenzol, etc., may account for an otherwise inexplicable and extreme cyanosis. *Allow pa-*

tient to recover from effects of the drug before administering an anesthetic or performing an operation not imperative.

General Hyperaemia General hyperaemia is seen in poisoning by belladonna, hyoscyamus, or coal-tar products; is common in the trivial fevers of infancy and early childhood, and may precede the specific exanthem in fevers of the eruptive type.

Jaundice (Icterus) Jaundice is characterized by a yellowish discoloration of the skin. It is frequently associated with digestive disturbance, malaise, slow pulse and subnormal temperature.

Jaundice is either obstructive, as in direct or indirect inflammation or obstruction of the common bile duct, or toxemic, the latter form being wrongly termed hematogenous as apposed to hepatogenous.

Obstructive Jaundice Stristly speaking, all cases of jaundice are obstructive, as even in the toxic form there is a high viscosity which favors absorption.

Symptoms of Obstructive Jaundice The skin, ocular conjunctiva and oral mucous membranes of the throat, lips or tongue yield the best evidence, especially if the latter are blanched by the pressure of the finger or better by a glass tumbler or microscope-slide. But even a marked discoloration may be invisible by artificial light. By daylight the color of the skin varies from a faint or brilliant yellow to a deep green or bronze (nelasicterus), sometimes simulating Addison's disease. Such cases are seen frequently in the last stages of cirrhosis of the liver. The sweat and urine

are discolored, the pulse and respiration are usually slow, the stools are pale gray, pasty and fetid, either constipation or diarrhea may be present and there may be a troublesome pruritus, and even urticarial or pupuric conditions. *A marked hemorrhagic tendency is shown in severe cases which is of special interest to the surgeon.*

CERTAIN DISEASES MAY CAUSE A CHANGE IN
COLOR AND
PRODUCE CERTAIN CHARACTERISTIC FACIAL
CHANGES.

Nephritis

In acute nephritis the skin is white, and an associated edema produces the peculiar and characteristic pasty pallor. In parenchymatous nephritis we meet with pallor, or in its late stages a sallow or brownish hue.

Baggy Eyelids

A tendency to edema exists frequently in the eyelids, especially in the lower lids is this often evident. The pale, puffy and almost translucent lid of early morning may later in the day become shrunk and wrinkled. The condition cannot be considered as pathognomonic, but should be regarded as suggestive. In chronic parenchymatous and in "mixed" nephritis, the face may also appear more or less puffy, sallow or even fawn-colored. Urinalysis should be made.

The kidneys act as the guardians and eliminants of the blood, and a diminution of their function will result in an abnormal condition of the blood.

Uremia

A toxic condition occurring with acute or chronic nephritis, characterized by convulsive seizures, vomiting, blindness, paralysis, disturbance of the heart and respiratory functions, with or without fever, is due to kidney or renal insufficiency.

**Renal
Insufficiency**

This condition is the result of inflammatory processes in the kidney, as nephritis—acute, sub-acute or chronic.

Nephritis

It may be induced by acute and chronic infections, exogenous, as the exanthemata and focal infections; and endogenous, as those originating in the intestinal tract; also by suppression of the eliminative processes of the skin, as by intense cold, burns, eczema, etc.

Pregnancy predisposes to kidney insufficiency. Artificially preserved foods and such remedies as mercuric bichloride, arsenic, lead, phosphorus, alcohol, turpentine and many vegetable drugs may excite nephritis or convert a chronic condition into an active acute nephritis.

Nephritics take general anesthetics poorly, are poor surgical risks and recover slowly.

Syphilis

The permanent upper central and lateral incisors or cuspids of the older children are often peg-shaped, and notched at their cutting edges, irregular and separated; perforated palate (not cleft palate), and saddle nose, due to necrosis of the nasal bones; fine linear scars radiating from the angles of the mouth due to wounding of tissue on the sharp edges

of the irregularly placed teeth, keratitis (inflammation of the ocular cornea), and chronic otitis media, are suggestive of syphilis. The two latter conditions may also be met with in persons suffering from tuberculosis. *Syphilis is unfavorable for healing, the bones are friable; it may be infectious. Aortitis which frequently exists is unfavorable for anesthesia.* Intrathoracic or abdominal aneurysms may develop which frequently terminate in sudden death.

Moisture of the Skin

Profuse sweating occurs not only during the course of continued fevers when the temperature is normal or subnormal. It may be seen in cases of great debility, as in convalescence, in severe pain, in malnutrition, in septic conditions and in "night sweats" of tuberculosis.

Dryness of the skin may be seen not only during the existence of fever, but in cases of excessive fluid from the kidneys or bowels, or in a swollen condition of the skin or subcutaneous tissues, as dropsy.

Voice

Hoarseness and aphonia are at times symptoms of great importance, pointing to acute or chronic laryngeal disease; the whispering voice may be due to edema of the glottis, laryngitis, acute or chronic tuberculosis or malignant condition, hysteric aphonia, or to a paralysis of the vocal cords.

Acute disease may favor acute ulceration following operative procedure, or acute infections may be disseminated by chronic condi-

tions; healing may be slow. Operative procedure may cause greater activity in the chronic condition, hence operative procedure should be reduced to the minimum.

CLINICAL HISTORIES

Previous Illness

Present Illness

SYMPTOMS

Fever

THE HEART AND BLOOD VESSELS

Arterial Pulse

Blood Pressure

CLINICAL HISTORIES

Previous Illnesses

A history of the previous existence of certain diseases may throw light upon the present conditions.

Present Ailment

The patient should tell of his volition, but in as few words as possible, the symptoms of his disease and their duration. One should discriminate between symptoms which are general in their nature, common to a large number of diseases and subject to various interpretations, and those which are local, peculiar or specific.

Do not express a disagreement with the statements of a patient while obtaining a history. An argument will frequently prevent the securing of important items in the history.

SYMPTOMS

Fever

Fever as a clinical manifestation is an elevation of the body temperature. It was formerly determined or estimated by the hand, but now more accurately by the clinical thermometer. In most acute diseases, as pneumonia and typhoid fever, the skin is dry and hot. In some of the intense intoxications, as small pox, it may be moist. Septic conditions are frequently accompanied by fever with sweating.

Care of Thermometer

On the other hand, a high rectal temperature may exist in cholera and the surface temperature be as low as 70 degrees. The thermometer is ordinarily applied to one of four points, these being in the order of frequency the mouth, the axilla, the rectum and the vagina.

In the use of the thermometer certain precautions must be observed:

(a) It should be cleaned before and after use.

(b) The scale should invariably be inspected, as the thermometers are self-registering and require to be shaken down after use.

(c) If used in the mouth, it should be placed well under the tongue and held by the tightly closed lips, not the teeth, of the patient. The time should be from three to five minutes.

(d) Axillary temperature should be avoided whenever possible, as being subject to greater error variation than in other regions.

If so taken, the thermometer should be placed deeply in the axilla, which should have been freed from any moisture present, and the elbow of that side should be close to the body and carried well forward. Axillary readings are particularly misleading in incipient tuberculosis or in slightly febrile conditions.

**Normal
Temperature**

Physiologists state that in normal persons the range may be 99.5° F. as a maximum, and 97.7° F. as a minimum. This is probably not too wide a range, if we consider the extremes of temperature in which individuals work. The use of some drugs as bromides, coal-tar products and others may cause subnormal temperature.

**Diagnostic
Import of
Fever**

Putting aside the rare cases of hysterical temperature and excluding deception and faulty technic, one may say fever is primarily of value in proving the existence of some organic ailment.

**Incipient
Tuberculosis**

Years of observation in private and public practice have convinced the writer that under ordinary living conditions, a persistent maximum daily temperature exceeding 99.2° F. or low morning temperature of 97.8° F. not otherwise accounted for is probably due to tuberculosis. Subnormal temperature which persists, not followed by temperature above normal, is most frequently due to a chronic infection very slightly progressive. By far the greater number prove to be cases of incipient

tuberculosis or chronic appendicitis—conditions recognized but rarely until the last two decades.

THE HEART AND BLOOD-VESSELS

Arterial Pulse

Certain conditions of the heart are most readily observed through observation of the arterial pulse. It is also a valuable index in determining the condition of other portions of the body.

Whenever possible the pulse should be taken casually while talking of other matters to divert the attention of the patient from the pulse taking, and allowance should be made for the nervousness incident to examination and the effect of physical exertion, as they tend to increase the heart action and change the condition of the pulse.

Technic

A correct technic is of the utmost importance and the patient's arms should be similarly in a position free from restraint, flexion, or muscular compression of the vessels. The pulse should be taken simultaneously in the two radial arteries, and three fingers applied lightly over the artery at the wrist.

Points to be Determined

(1) The size of the artery. (2) Pulse rate or frequency. (3) Regularity of rhythm. (4) Uniformity of strength. (5) Synchronism and equality of the right and left radial pulses. (6) The force required to obliterate them,—tension. (7) Abnormal thickening of the artery,—arterio-sclerosis.

When the physician's fingers are applied to

the artery, the first four points are determined almost unconsciously and instantaneously, the vessel being lightly rolled under the finger to get its size, and pressure made with the upper finger until the pulse is lost to the lower, the force exerted being the measure of tension. The empty artery is then rolled under the lower finger to detect any thickening of its walls,—arterio-sclerosis; any vessel that can thus be felt as a distinct tube is sclerotic and hence abnormal. Such may be merely palpable, distinctly rigid, or carry tiny plaques of lime salts. Chronic nephritis may co-exist. *There is in arterio-sclerosis danger of hemorrhage from ruptured cerebral arteries under stimulus of a general anesthetic or excitement.*

**Pulse
Frequency**

The average normal rates are; for the first year of life from 130-140; from the first to the fourth year gradually dropping to 105 or 110; and so diminishing until the fifteenth or sixteenth year when it reaches from 75 to 80 beats per minute, with extremes of 58 to 90 in different individuals. During middle life and up to 60 years frequency is slightly diminished, sometimes increasing somewhat beyond that age. Women show a rate from 5-8 beats a minute faster than men, and it is slightly slower in tall than in short persons. Any abnormal increase in frequency suggests the use of the clinical thermometer, and we find that, as a rule, the rate increases from 8 to 10 beats per minute for each degree of temperature above the normal, and further, that the be-

havior of pulse is of both diagnostic and prognostic importance.

DETERMINATION OF BLOOD PRESSURE

Fortunately for the clinician, blood pressure may now be measured quickly and accurately by simple and relatively inexpensive instruments, nearly all of which depend upon the same general principles, i. e., the translation of the pressure required to obliterate the arterial pulse into the height of a mercury column in a manometer tube or its equivalent.

Technic

The hollow armlet applied midway between shoulder and elbow is inflated by the hand bulb until the radial pulse is lost, then by the outlet thumb screw the pressure is lowered until the pulse return is just perceptible. As the pressure is equal in all parts of the closed system, the height of the mercury column in the manometer tube is an exact index and the reading represents the "maximum" or "systolic" pressure. "Diastolic" or "minimum" pressure is determined by noting for ten or twelve pulsations the increasing amplitude of the pulse wave registered by the mercury column as the pressure is reduced in 5 mm. series. The point causing base line of the maximum excursion is the index of diastolic pressure. Below that is a limited pressure area of equal amplitudes. The "mean" pressure represents the average of systolic and diastolic readings, and the "pulse" pressure is the difference be-

tween the systolic and diastolic readings. Diastolic readings run about 25-40 mm. below systolic, in low tension they vary from 50-80 mm., and in aortic regurgitation up to 100 mm. A loose band or a rapid or excessively small pulse makes diastolic pressure determination impossible. In every case the arm band should be closely adjusted, the arm supported at the heart level, and the same position taken for a series of tests. The limit of error in calcareous arteries is but 5-10 mm., and is negligible or easily estimated. The same figures represent the difference between females and males and the standing and sitting posture. In normal pressure four factors are concerned, viz.: the initial heart energy, peripheral resistance, blood volume and the elasticity of the vessels. The normal readings according to Janeway are: for young adults, 100-130 mm.; older adults, 100-145 mm.; children, 90-110 mm.; infants under two years, 75-90 mm. Excitement may cause a rise of 40 mm., and concentrated physical effort a slight increase. A stethoscope placed over the brachial artery at the bend of the elbow is preferred by many as having greater accuracy.

The cuff is inflated to the extent that the systolic pressure is obliterated in the radial artery. The stethoscope is placed over the brachial artery, not touching the cuff, and the pressure gradually released. Four phases are recognized.

1. The first clear thumping, pounding

noise indicates pressure sufficient to force blood into artery below the cuff and is the systolic pressure.

2. This is followed by a hiss or murmur, which disappears.

3. This is replaced by a clear sound.

4. This is followed by a muffled, distant sound, which is the beginning of the fourth phase or diastolic pressure.

Both methods may be used at the same time.

**Abnormally
High**

In chronic interstitial nephritis, arteriosclerosis, high peripheral resistance and increased heart energy bring about high blood pressure readings.

Low

The conditions giving the lowest readings are shock, collapse and concealed hemorrhage. In visible hemorrhage attended by nervous excitement, fear and apprehension, the pressure is raised due to the nervous tension. The acute infectious diseases, anemias and cachexias, and the terminal stage of all diseases show low pressure as does also weakened heart muscle.

INFECTIONS

IMMUNITY

INFECTIOUS DISEASES OF THE RESPIRATORY TRACT.

- Post-Nasal Adenoids
- Tonsillitis
- Laryngitis, Acute
- Laryngitis, Tuberculous

ADMINISTRATION OF VACCINES

FOCAL INFECTIONS

- Influence upon the Heart

OTHER OF THE INFECTIOUS CONDITIONS

- Scarlet Fever
- Measles
- German Measles
- Small-Pox
- Chicken Pox
- Whooping Cough
- Mumps
- Infantile Paralysis
- Typhoid Fever
- Typhus Fever
- Plague
- Rabies

INFECTIONS

Infect "To communicate or transmit the specific virus or germs of disease" (Gould.)

To infect by any means, direct or indirect.

Infection Having the power of infection.

Infectious Infectious diseases are those which are produced by the introduction and multiplication of infectious organisms in the tissue of the body. Infectious organisms may belong either to the vegetable or animal kingdom; in some instances it is difficult to determine to which of these kingdoms the organisms belong.

INFECTIOUS DISEASES ARE COMMUNICABLE, THEREFORE ARE PREVENTABLE. INFECTIOUS DISEASES ARE RESISTED BY AND RECOVERED FROM BY THE ESTABLISHMENT OF IMMUNITY.

IMMUNITY

Natural When a species or race or individual is not susceptible to attack by given organisms, or at least not to an extent that diseased conditions result.

Acquired When, because of infection or otherwise, changes have been produced in the system which enable the individual to resist, to a greater or less degree, attacks of given organisms which otherwise commonly produce disease in the species or race.

ACQUIRED IMMUNITY

Passive Conferred by *introducing* immunizing agents into the body,—serums or anti-toxins.

Active Conferred by *producing* immunizing agents in the body; (development or course of disease, or introduction of toxins.)

Partial When it modifies the severity of disease—the disease running its ordinary course.

Complete When it prevents the development of disease.

When it produces a cure.

When the disease runs an abortive course.

Temporary Infection by the same organism may occur after recovery from the effect of the infection.

Permanent An attack of illness from infection, or introduction of toxin, produces permanent immunity to re-newed infection.

We owe to Metchnikoff the first real attempt to explain active resistance of the body

against bacterial invasion. He developed the idea that certain cells normally possess the power to ingest, digest and destroy foreign matter and particles of dead tissue—the process of phagocytosis.

Metchnikoff believed this to be the main, if not the only active defense agency of the body against injury by bacterial invasion. This was the foundation of the Metchnikoff Theory of Immunity.

Metchnikoff states that the cells destroy the bacteria they incorporate by the enzymes (digestion) contained within their cytoplasm and produced by their own synthetic processes. If these enzymes are in the cells and the cells take up the bacteria, the latter are destroyed within the cells by the enzymes (digestion). If the enzymes are liberated by the destruction of the cells (phagolysis), it is obvious that the tissue juices which have taken up the products of cellular disintegration become endowed with the solvent powers originally possessed by the cells themselves. Thus Metchnikoff's theory of phagocytosis no longer means only the incorporation of the bacteria by the cells, but includes all the reactions involved in the phenomena of immunity referable to chemical products formed by, and commonly contained within the cells and capable of acting upon the infective agents wherever they happen to meet. It is believed that these enzymes destroy not only the bacteria but their products as well, so that immunity may mean either

destruction of bacteria or destruction of bacterial products. (Immunization against bacteria — immunization against bacterial products.)

Metchnikoff makes no distinction between the different classes of enzymes in these activities. He and his followers consider it probable that the same agent destroys the bacteria and neutralizes their products. Thus, the tendency of this hypothesis is to regard the phenomena of immunity as simple chemical reactions. A common immunizing agent which is modified to greater activity against a specific disease.

To sum up this theory, immunity does not always depend upon the same fundamental reactions. It may depend upon the incorporation and destruction of bacteria by body-cells, or upon the destructive action of the body juices into which the cellular enzymes have been discharged; or, when micro-organisms are not directly engaged in the production of disease, and the morbid changes result from the presence of a toxin, as in diphtheria and tetanus, immunity may depend upon the action of one of those enzymes on the poison introduced. According to this conception, therefore, diphtheria antitoxin must protect either through the action of cellular enzymes which it contains already formed, or by stimulating the formation of protecting enzymes within the body. (McFarland in Cohen's System of Physiologic Therapeutics.) Note the progres-

sive steps—not a disagreement but an advancement. Purely chemical—passive then active, with explanations of chemical action, then organic chemical action.

Ehrlich's hypothesis is based on the mechanism of cellular nutrition, so that, as Welch has pointed out in his Huxley lecture on immunity, the two theories (Metchnikoff and Ehrlich) have this view-point in common. Ehrlich's conceives the structure of protoplasm to be extremely complicated and characterized by enormous numbers of side-chains or groups of combining molecules—a conception borrowed from the structural diagrams of organic chemistry. These side-chains, each being a definite molecular group, are supposed to have specific combining affinities. It is through the combination of particular molecular groups with appropriate groups in the tissue juices that cellular nutrition and metabolism are supposed to be maintained.

PROPHYLACTIC AND THERAPEUTIC USE OF SERUMS AND VACCINES.

The definitions formerly given of active and passive immunity should be recalled at this time; also of vaccines and serums.

PROPHYLACTIC INJECTIONS

- A. *Active Immunization*—in which vaccination and protective inoculations are included.

1. Inoculation of virulent organisms.
 - (a) Inoculation of non-fatal doses (experimental work).
 - (b) Inoculation of virulent organisms into tissues which have natural resistance (small-pox inoculation — unfavorable condition in the skin and small doses administered).
2. Injection of attenuated virus or toxin (attenuated by environment or passing through animals)—Vaccination against small-pox.
3. Injection of killed organisms (vaccination against typhoid, plague and cholera).
4. Injection of bacterial constituents.
 - (a) Bacterial cell plasm (Koch's T. R.).
 - (b) Soluble bacterial products (bacterial proteins—Koch's O. T.).
- B. *Passive Immunity*—prophylactic injection of serum (diphtheria).
- C. *Mixed Active and Passive Immunization*.
 Abortive Diphtheria.
 Varioloid.
 Tuberculosis.

CURATIVE INJECTION

- A. *Active Immunization*.
 1. Injection of killed organisms or toxins in small doses to hasten anti-body

formation (typhoid, etc.)—any disease treated with vaccines.

B. *Passive Immunity.*

Anti-toxic serums (diphtheria).

It appears that serums are more powerful in their action when used as prophylactic agents than as curative agents.

With serums, passive immunity is of short duration—in many instances not more than two or three weeks. However, they may be useful to combine with vaccines for active immunization, or following their use the body may develop active immunity.

Time and amount of injection of *serums* is of importance whether for prophylactic or curative measures.

INFECTIOUS DISEASES OF THE RESPIRATORY TRACT

DISEASE OF THE PHARYNX

Acute, chronic, hypertrophic and atrophic processes occur in the pharynx and nasal mucosa.

Post-Nasal Adenoids

These hyperplastic lymphoid structures greatly affect the health, physical and mental development and future life of children. In all cases there is increased liability to acute coryza, pharyngitis, tonsillitis, laryngitis and bronchitis and added danger from attacks of measles, scarlet fever, whooping cough and diphtheria. If unrelieved, they may undergo atrophy as adult life approaches, usually leaving behind chronic naso-pharyngeal catarrh, high-arched palate, irregular teeth with maxillary protrusion and a deformed chest. Mouth breathing, nasal voice and snoring, and the evident increase of respiratory obstruction in the dorsal recumbent position should call attention to these cases. Impaired hearing is extremely common, due to involvement of the Eustachian tube, and sinus infection is favored.

These patients may present deformities of the face, mouth and nose; and the diseased pharynx is frequently the seat of chronic infections which impair the general health; such patients are poor surgical and anesthetic risks.

DISEASES OF THE TONSILS

Tonsilitis, Acute Catarrhal—This common disease of young people is rare in infants and the elderly.

Symptoms Onset rapid.

A chill or chilliness, muscular and bone pain are followed by rapidly rising fever, with sore throat and dysphagia; the temperature reaches 103°-105° F., and the voice may be thick and nasal. The tonsils are swollen and dotted with a readily detachable exudate, which may become confluent, but tends to be limited to the tonsil. Great care should be taken to differentiate from diphtheria.

Tonsilitis— This differs from the preceding form chiefly
Acute in the predominating involvement of one ton-
Follicular sil, more violent onset, higher fever and pulse
Suppurative rate and greater prostration. The cervical glands are enlarged, salivary secretion is increased and within two or three days pus forms. Both tonsils may be involved; the pus may burrow with unexpected rapidity, and edema of the glottis may occur. Sequela—Chronic hypertrophied tonsils, common in childhood, continuing throughout life in many cases.

Tonsilitis— This differs from the above in that the
Subacute severity is less; the sequela are the same and
Follicular quite as frequent.

Tonsilitis— A sequela of the last two preceding condi-
Chronic tions. It is one of the most important focal
Follicular infections.

Laryngitis

An acute catarrhal inflammation of the larynx, which when due to infection is characterized by soreness of the throat, hoarseness or loss of voice, in adults; frequently a metallic cough. Course about three to twelve days.

In children, because the glottis is narrower, the symptoms may be more serious. There is danger of laryngeal spasm (croup) and danger of suffocation.

This form is frequently associated with acute conditions of the mucous membranes of the pharynx, bronchi and nasal passages (cold in the throat, on the chest or in the head). The course of these infections is frequently from one to two weeks, which could probably be much reduced by the patient ceasing activities and taking complete rest with the first appearance of symptoms. The spread of these infections would probably be much reduced by such treatment. Repeated infections result in chronic inflammation of these tissues.

**Laryngitis
Tuberculous**

Primarily, tuberculosis in this region is extremely rare and usually, though not always, the lesion indicates an advanced pulmonary lesion. The symptoms are those of a persistent chronic laryngitis, hoarseness or aphonia being a marked and early symptom, and swallowing painful if there is epiglottic or pharyngeal ulceration. The laryngeal mucous membrane is at first pale and later an ashy gray; the arytenoids show a pyriform swelling and the epiglottis is turban-shaped. The ulcers themselves are shallow and broad with gray

bases and irregular outlines, and the vocal cords usually appear "moth-eaten" from ulceration. The tubercle bacilli can usually be demonstrated easily and this makes the diagnosis positive.

Tuberculous laryngitis frequently interferes with nutrition. The accompanying pulmonary condition tends to progress more rapidly. The patient's resistance to trauma is low, healing is frequently slow and there is a possibility of wounds about the mouth becoming infected. Extensive operations should be avoided.

Tuberculous laryngitis is to be differentiated from syphilitic and cancerous affections of the larynx, with which it may be associated, and also tumors and paralysis due to nerve pressure and central lesions.

DIPHTHERIA

An acute infectious disease characterized by a fibrinous exudate, usually upon a mucous membrane, and with constitutional symptoms caused by the absorption of toxin.

Etiology

Caused by the Klebs-Löffler bacillus which may be communicated directly from the membrane or discharges, from nasal and buccal secretions of convalescents, from the throats of normal persons ("diphtheria carriers") by infected articles and infected milk. It varies greatly in virulence, some strains causing no pathological effects.

Pathology The local lesion may be a simple catarrhal inflammation or a greenish or gray exudate containing pus, blood and epithelial cells. It is formed by necrosis of the epithelium and subsequent exudation into the necrotic tissue. The diphtheria bacilli live in the membrane.

Associated lesions may be found in the kidney, liver, spleen or lymph nodes. There may be cardiac changes, broncho-pneumonia or degeneration of peripheral nerves, causing paralysis.

Incubation Two to seven days.

Symptoms Diphtheria onset frequently less rapid than acute catarrhal tonsilitis. Membrane appears on tonsils, spreads slowly, grayish white, dirty gray or yellowish; adherent, leaving bleeding surface. Cervical lymph node involved. Positive diagnosis—finding diphtheria bacilli.

Treatment Treatment—antitoxin early. Recovery may occur in a week but important sequelae may last indefinitely. The Schick test—may aid in determining what persons are susceptible to the disease, by giving a positive reaction. Diphtheria is a systemic disease; the membrane may form upon any mucous surface or wounds.

Complications Broncho-pneumonia, nephritis, hemorrhages from mucous membranes, urticarial or purpuric eruptions.

Sequelae Paralysis, due to toxic neuritis and affecting most frequently the soft palate, less often the pharyngeal, laryngeal, ocular, facial or res-

piratory muscles. Sudden death may occur due to neuritis of the cardiac nerve.

Diagnosis Made with a certainty upon finding the bacillus in cultures.

Prognosis Good in mild cases. Mortality formerly about 40%. With antitoxin treatment 12%. If antitoxin is used early the mortality is much less than in cases in which it has been delayed.

Toxin-antitoxin, Pure cultures of diphtheria bacilli yield toxin, which, injected into animals causes intoxication and death. If small doses, insufficient to cause death, are injected at intervals, specific diphtheria antitoxin is formed, which is contained in the serum of the blood. By the application of this principle, great quantities of diphtheria antitoxin are prepared, in horses, and used in the treatment of diphtheria, producing passive immunity in the individuals treated.

The blood of many normal individuals contains diphtheria antitoxin in demonstrable quantities. This is stated to exist in sufficient quantities to afford protection to about 80% of the new born, 90% of adults and 50 to 60% of children.

Schick Test, 1-50 of the minimum tested lethal dose of diphtheria toxin for a guinea pig, which weighs 250 grams, is diluted to make 1-10 cc. of fluid. This is injected intracutaneously and examined after twenty-four hours. Those who show a definite inflammatory reaction are susceptible to diphtheria. In

1909 Dr. Theobald Smith demonstrated that mixtures of toxins and antitoxins of diphtheria bacilli, could be injected into guinea-pigs without harmful results, but that active immunity could be established which would last for several years. This combination has been standardized and applied to the protection of man under the name of the Toxin-antitoxin treatment. The results of this prophylactic treatment have been summarized by the California State Board of Health. A brief summary of their conclusion is that:

Toxin-antitoxin will prevent diphtheria.

Toxin-antitoxin and antitoxin are two different products.

Toxin-antitoxin does not give protection against diphtheria immediately. Immunity against the disease is not acquired until at least three months after the administration of the toxin-antitoxin. It then gives protection for a long period of time, probably for life.

Antitoxin is used for the treatment of diphtheria and for giving protection at once to persons who have been exposed to the disease. Antitoxin affords protection against diphtheria for a short period of time—two or three weeks.

Toxin-antitoxin affords protection, probably, for life. It is harmless. It does not cause a sore on the arm. It produces little or no reaction in the individual to whom it is given. Persons who have been previously protected by means of toxin-antitoxin will not need antitoxin.

TUBERCULOSIS

Tuberculosis is a disease resulting from the introduction of the tubercle bacillus, a minute vegetable micro-organism about 1-80,000 of an inch in thickness and about 1-6,000 to 1-16,000 of an inch long, into the system.

Tuberculosis is a communicable disease.

Tuberculosis is a preventable disease.

Tuberculosis is a curable disease.

Tuberculosis, during the later stages, is known as consumption.

Tissue Changes and Resistance

When tubercle bacilli find lodgement in the tissue, an effort is made for their destruction; this failing, an inflammatory condition develops. They are surrounded by body fluids and cells which, in most instances, organize into fibroid masses or scar tissue, about the size of a pin head, encapsulating the tubercle bacilli, —a *tubercle* is formed.

Tubercle a Healed Tuberculous Lesion

Under these conditions the bacilli become more or less dormant. They are as seeds put away for future planting; unless their environment is changed they will not grow. The longer they remain in this condition the less readily will they grow. Scar, uninterfered with, matures with age,—it becomes harder, firmer, more resistant to physical and bacterial stresses. This small mass of scar encapsulating tubercle bacilli is called a *tubercle*. It is a healed tuberculous lesion, an arrested tuberculous focus, which, with time, may become a permanent arrestment or cure. Several of

these developing in close proximity form a tuberculous mass or scar.

**Development
of Resistance**

If the infection is received sufficiently slowly, this mass may be increased without producing symptoms, the tubercle bacilli gradually losing their virulence and the scar acquiring greater density,—a degree of resistance is developed. Add to this the formation of anti-toxins, in an effort to neutralize toxins due to the presence of the tubercle bacilli, and we have developed that degree of resistance which, when attained, is sufficient to enable us to resist increasing amounts of infectious material, differing according to conditions in each individual.

The virulence of the infectious organism, the quantity of infection received within a given time, and the resistance developed determines whether or not the health of the individual is appreciably influenced.

**Infection
Almost
Universal**

Tubercle bacilli are met with by most persons in the earlier years of life, but under conditions which do not appreciably impair health. There is produced, however, tissue changes, — fibrosis or scar, — healed lesions. Frequently these are found in the lymph nodes of the hilus tissues of the chest, which finally become dense masses of fibrous tissue and later may undergo calcareous or caseous degeneration. It is these masses which are almost universally seen in radiograms of the chest. These scars become firmer and more

resistant with age, and the encapsulated bacilli lose their virulence.

**Infection
Compatible
With Health**

Infection exists, but without appreciable influence on health. This condition is known as a *latent tuberculous condition*, which is almost universal. Such persons are not spoken of as tuberculous, but they do possess greater resistance against infection by tubercle bacilli from contact with persons suffering from tuberculosis in an infectious condition than if they had not developed this scar.

If the infection becomes greater than resistance, health is impaired. If during the first year of life the infection is sufficient to produce symptoms in the individual, death generally results, because there has been insufficient time to develop adequate resistance. If symptoms develop later the extension of the lesions may cease, — fibrosis or scar develop, — the same general conditions developing as occurred in the formation of the smaller mass or tubercle. An arrestment has occurred through the formation of scar. Much of this scar tissue is permanent. Its presence is a factor in maintaining the future resistance of the individual against infection. In many cases the existence of the tuberculous infection may not be known to be a factor in the “under-par” child, in whom other infections exist, the proper treatment of which restores the child to health, but the tuberculous foci continue to exist in a latent form.

**Manner of
Arrestment**

While these healed foci aid in maintaining

the resistance against infection, that resistance is not complete or permanent. It may be overcome by an overwhelming amount of infection. Following recovery from this childhood infection, most frequently the development of an active tuberculous condition is due to a *re-activation of a healed lesion*.

STRESSES

This is brought about by *stresses*. These stresses may be (a) mechanical, (b) bacterial, (c) general.

Mechanical Stresses

Are more frequently strains through muscular action which involves scar tissue, overexertion or continuous work leading to general, prolonged exhaustion.

Bacterial Stresses

Are those infections which act directly upon the scar or bring about degenerative changes, and those which reduce resistance.

General Stresses

Include other factors which reduce resistance, i. e., unsanitary surroundings, undernourishment, excesses of all kinds, whether overwork or play, etc.

Mechanical and bacterial stresses frequently produce inflammation of the latent infected **foci**, thus changing the environment to a condition unfavorable for the growth of the tubercle bacilli to a favorable one. In most instances this is again recovered from by processes similar to that which checked the former activity. This is repeated many times, in most cases, before symptoms and signs are sufficient that a diagnosis of tuberculosis is

made. The relief from removable stresses is of greatest importance in aiding the body to check the progress of the infection and hold it in check,—formation of new scar and allowing the scar to mature.

Pathological History The pathological history of tuberculosis may be summarized as follows:

- (a) Childhood infection healed by formation of scar,—permanent infected foci.
- (b) Reactivation of these foci through stresses or pathological changes.
- (c) Arrestment of the reactivated condition, which may be permanent—recovery—or temporary and followed by destructive changes.
- (d) The relief from bacterial toxins, produced by associated infections, is of great importance. It is through the removal of some of these foci that the work of the dentist becomes of great value, as well as in aiding nutrition, through providing means for the more thorough mastication of food.

When we consider the prevalence of latent foci of tuberculous infection in the lungs, the frequency and extent of the infected foci of the investing tissues of the teeth by pus producing organisms and the channels of communication between these areas, it is not difficult to appreciate the possibility of influence of these associated infections upon the pulmonary tuberculous foci.

INFLUENCE OF FOCAL INFECTION ON THE TUBERCULOUS

Influence of Operations on the Tuberculous

When we consider the barriers of the tissues, mechanical and chemical, which serve as a protection, and added to these, the comparatively slow development of activity of the tuberculous focus, then we may appreciate the apparent infrequency with which this reactivation occurs. However, the constant absorption of the toxins from these foci lower resistance and, if a large amount of the infectious material, other than tuberculous, is thrown into the system through operative procedure, the condition becomes favorable for reactivation of a latent tuberculous focus, or may materially interfere with the favorable progress of an existing active process toward recovery. I have not had an opportunity to collect data in regard to this, but am more and more impressed with the importance of these conditions as I have greater opportunity for observation.

I also am more and more impressed with the necessity for careful consideration of treatment of these infected foci. In infected tissue the treatment of only a small area at one sitting is important and the least possible amount of trauma should be produced.

Allow time for the patient to recover completely from the results of the increased infection between treatments.

**Limit
Operative
Procedure**

Extract only one or two teeth at one sitting, allowing time for recovery. Frequently five days or more should be allowed between operations. The danger may be reduced by treatment of the infected foci before extracting.

**Decrease in
Tuberculosis**

The mortality from tuberculosis has decreased from about two hundred per hundred thousand to about one hundred per hundred thousand population in the registration area of the United States during the last twenty years. The decrease has included all classes excepting girls from the age of fifteen to twenty years. In this class there has been an increase in the death rate of about seven per cent.

From intensive work which has been done in selected districts, as Farmingham, Mass., it seems probable that through co-operative efforts the death rate may be much further reduced.

THE ADMINISTRATION
OF VACCINES

THE ADMINISTRATION OF VACCINES

The most frequent errors committed in administration of vaccines are the giving of too large doses and repeating at too short intervals. In the hypodermic administration of the vaccines more commonly used prophylactically and therapeutically, the following suggestions are valuable guides for the control of doses.

If there should be no redness at the site of injection, the next injection may be administered on the fifth day following, increased by one-half to double the former dose. Continue the administration in this manner unless local reaction appears. If redness the size of a silver half dollar occurs, which lasts more than forty-eight hours, I would repeat the former dose; should the area of redness be greater than this, or persist longer, I would suggest waiting forty-eight hours after all redness has disappeared, then administer one-half the former dose.

There are exceptions in the use of typhoid, small-pox and others for which special directions are given with each vaccine.

The vaccine against the bacteria which most frequently produce "colds" in most cases may be begun with an initial adult dose of fifty million bacteria. Persons who are known to be especially sensitive should be started with smaller doses, even as low as ten million.

Persons who have taken vaccines, and whose resistance is known, may be given from one hundred to two hundred million, followed by increasing doses. The increase may be proportionate to the initial dose, that is, in the person who is very sensitive and develops a moderate degree of local reaction with a dose of ten million, the increase should not exceed ten million, while an individual whose initial dose is fifty million or more may be increased fifty million.

The initial dose of vaccine against tuberculosis should be governed by a cutaneous test. Due consideration should be given to the tissues in which the focus exists, to degree of activity, also its extent; the patient with a small focus recently re-activated will be more likely to be sensitive to the vaccines. Patients with involvement of tissues such as the eye, meninges, lymph nodes, joints and bones will, all other things being equal, be more sensitive, and in the order named, than the softer tissues. The pulmonary tissues possess greater tolerance to vaccines than do most of the tissues in which tuberculosis is frequently found.

Dose of Tuberculin

Based upon these suggestions, the initial dose of tuberculin, or vaccine prepared from tubercle bacilli, may vary from one billionth of a milligram (0.000,000,001 mg.) in specially sensitive cases to one thousandth milligram (0.001 mg.).

Sodium succinate manifests a selective action for tuberculous tissues and acts very

**Sodium
Succinate**

much as does a vaccine. In its administration the suggestions made in regard to vaccines apply. Reactions due to its use are apparently less severe and less prolonged than with tuberculin. For this reason the writer frequently begins treatment of hypersensitive cases by the use of sodium succinate in beginning doses of about 0.001 mg. The patient whose tolerance to sodium succinate reaches 1. mg. will as a rule tolerate 0.001 mg. of tuberculosis vaccine. From a practical standpoint in the treatment of tuberculous conditions, a dose exceeding five mg. of tuberculosis vaccine or ten mg. of sodium succinate is ordinarily not required.

In the use of these vaccines, however, we should always bear in mind that it is the result and not a specific dose which is needed. Frequently very sensitive patients make more rapid progress on small doses suited to their condition than the more tolerant patient using correspondingly larger doses.

INFLUENCE OF FOCAL INFECTIONS UPON THE HEART

Endocarditis Among well recognized and more important results of focal infection of the peridental tissues is a painful condition of the tendons of the muscles and joints which is frequently spoken of as muscular rheumatism, and the more acute inflammation of the tissue of joints, inflammatory rheumatism. This is frequently accompanied by endocarditis with the resulting changes in function of the valves of the heart. The result of this condition may be either obstruction to the free passage of the blood through the valves, or insufficient closure of the valves allowing regurgitation of the blood backward through the valves against the blood stream. As a result of this there is hypertrophy of the muscular tissue of the heart which produces a measure of compensation for the changes in the valves. As a result of the changed condition of the valves, vegetations are produced on the valves which, when freed, form emboli, which find their way to the different parts of the body with greater or less unfavorable results. If one of the more important arteries of the brain is reached by these emboli, cerebral apoplexy with the resulting paralysis or death ensues.

Ulcers of the stomach and intestinal tract, and infections of the gall-bladder and other

abdominal viscera have been attributed to infections from the nose, throat and peridental tissues.

The work of Rosenow of the Mayo Clinics, confirmed by others, is of great interest in showing the selection of tissue by given strains of organisms from foci of chronic infections. A group of 666 animals were infected with organisms from foci of infections from patients suffering from secondary lesions in different tissues. The animals developed infections in corresponding tissues in an average of about 75%.

During the past few years the writer has frequently had occasion to make examinations of adolescents who have been unable to satisfactorily perform the prescribed gymnasium work in the schools.

Most of these children had been regarded as lacking in energy; they may have been studious, but had avoided amusements which required physical exercise. Upon fluoroscopic and radiographic examination I was impressed with the frequency of the occurrence of the *"drop heart,"* an elongated and narrowed condition of the heart.

Green in Medical Diagnosis states that this is one manifestation of a general visceroptosis, and may or may not constitute its dominant feature clinically and anatomically; that no ill health may necessarily develop as the result, but that symptoms tend to develop under conditions of impaired nutrition.

Drop Heart

The heart, by reason of the constant demand made upon its musculature and its sensitiveness to toxins, acute and chronic, is prone to manifest symptoms. During observation of the young persons above referred to I was quite impressed with the frequency with which I found the existence of chronically infected foci. Careful examination has revealed such infection in all cases thus far examined.

When we consider the prevalence of chronic infections which fail to manifest local symptoms and which for this reason are not discovered early, and the influence of these chronic infections upon the general muscular system, we may well consider whether or not these infections may have been the cause of the changed conditions of these organs, rather than being due to poor nourishment and development.

When symptoms have been manifest, especially of the heart, they have improved with the care of the infection and recurred with the development of greater infection, sufficiently frequently to convince me that a causal relation exists.

Myocardial Changes

The evidence of physical weakness of the heart is frequently manifest by low systolic and pulse pressures. If these conditions are observed when the patient is in the recumbent position, a markedly decreased pulse pressure occurs upon rising to a standing position in cases of marked myocardial weakness. I have observed this symptom improve or grow

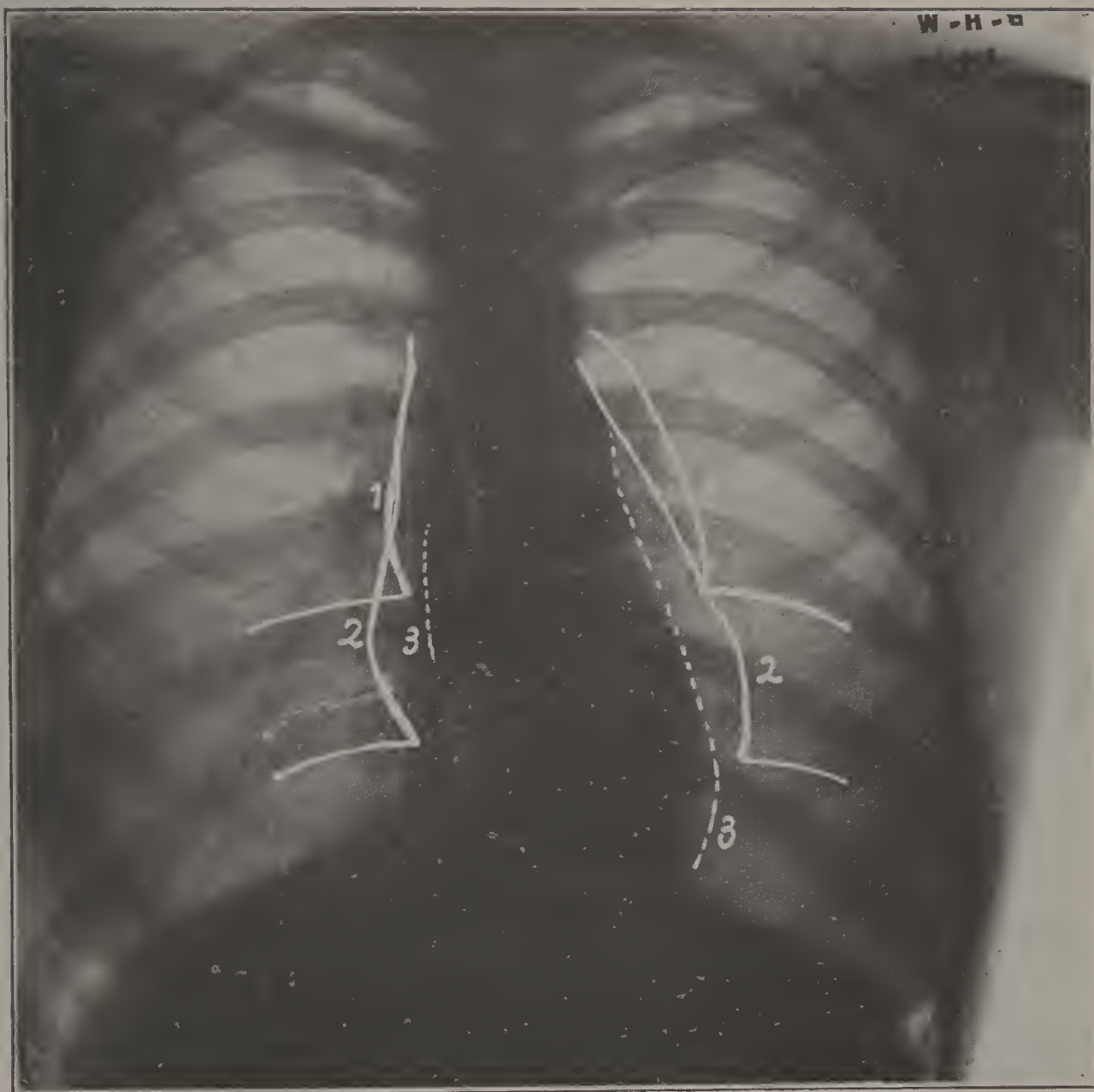


FIG. 1.—Young woman of slender build.

Radiographs taken during forced inspiration.

Upper cardiac outline (1), of normal heart, is of a person about the same age and weight, short, stout build, applied on this chest; this gives contrast with middle outline (2), indicating normal cardiac outline of this chest; note width of intercostal spaces. The dotted line (3) indicates stereoscopic cardiac outline, a condition frequently met with in the underweight adolescent. This condition has frequently been associated with foci of chronic infection of the investing tissues of the teeth, the tonsils or nasal passages and sinuses; not infrequently more than one region is infected.

In this type of heart the action of both ventricles is plainly visible in the fluoroscope, in the lower portion of the shadow, contracting and dilating at the same time, while the action of the auricles are observed toward the top. It is the change in the ventricles which take greatest part in these myocardial changes. As time goes on the tendency of this type of heart is to yield to strain and we may observe the gradual dilation of the lower portion of the ventricles, more frequently the left.

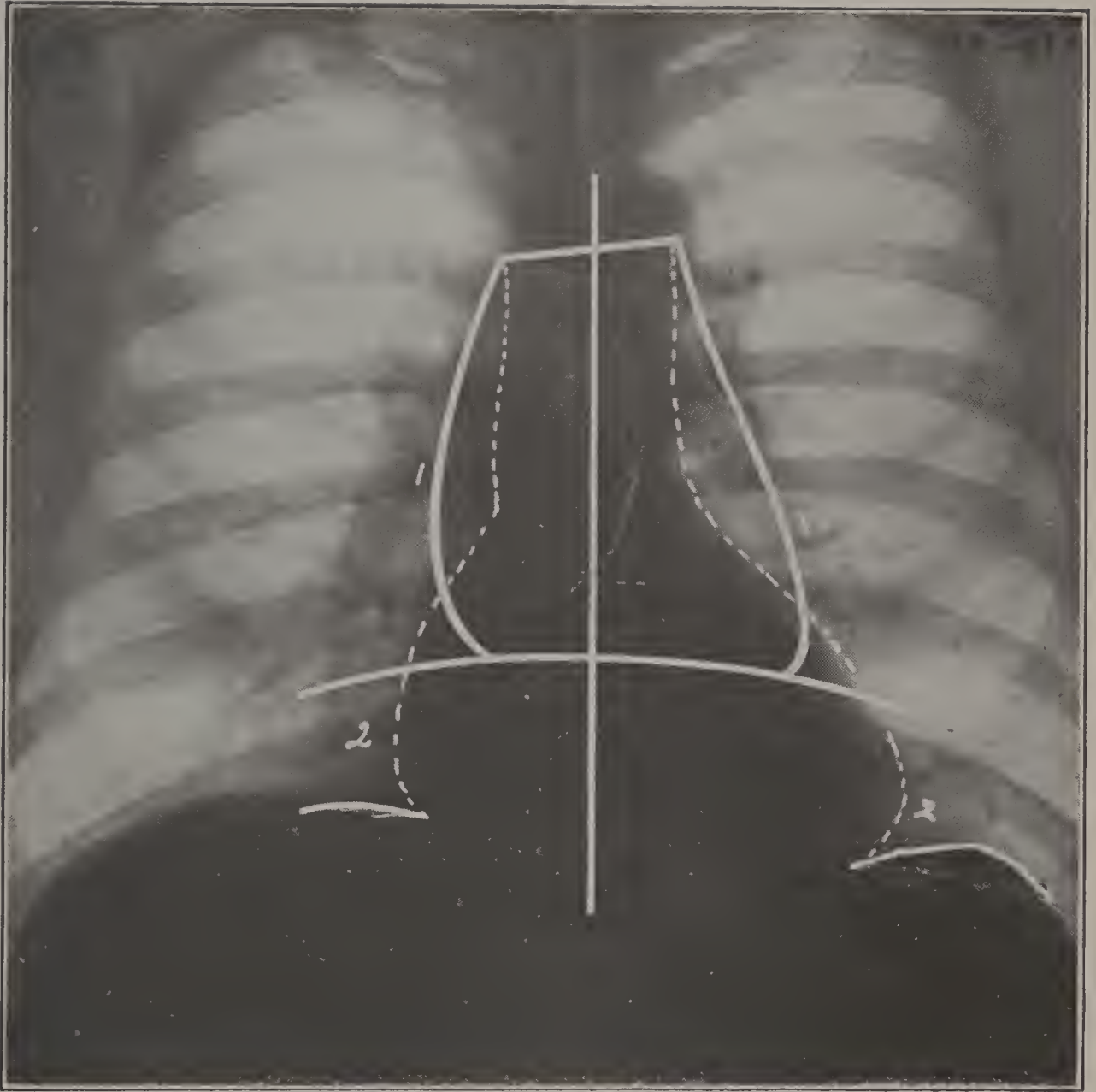


FIG. 2—Radiographs taken during forced inspiration.

Long standing infection of peridental tissues. Had been in good clinical health until past few months, when ill defined symptoms of toxic condition began to be manifest. Following the extraction of four teeth which were surrounded by extensive chronic infection, pain developed in the precordial region, with slight extension down the left arm, no cardiac murmurs.

Blood pressure, second and third phases, 70-86.

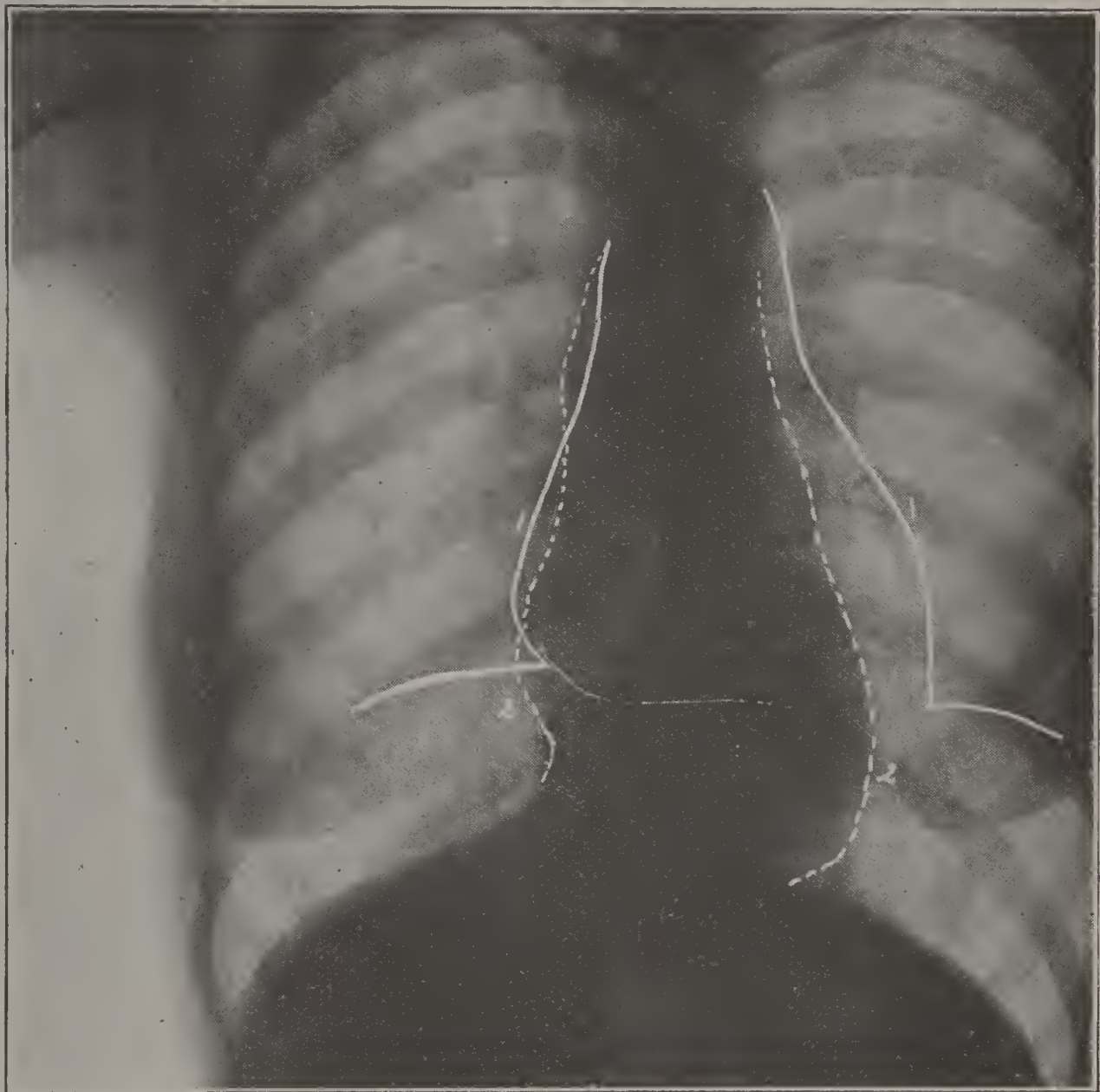


FIG. 3—Radiograph taken during forced inspiration.

Solid line (1) within normal limits of stereoscopic cardiac outline. History of moderate degree of chronic focal infection. Observe dropping and narrowing of the actual stereoscopic outline. Recently signs of mitral insufficiency were detected. Observe the apparent beginning of ventricular hypertrophy.

Blood pressure, reclining, second and third stages, 90-110, standing, about one minute after rising 80-110.

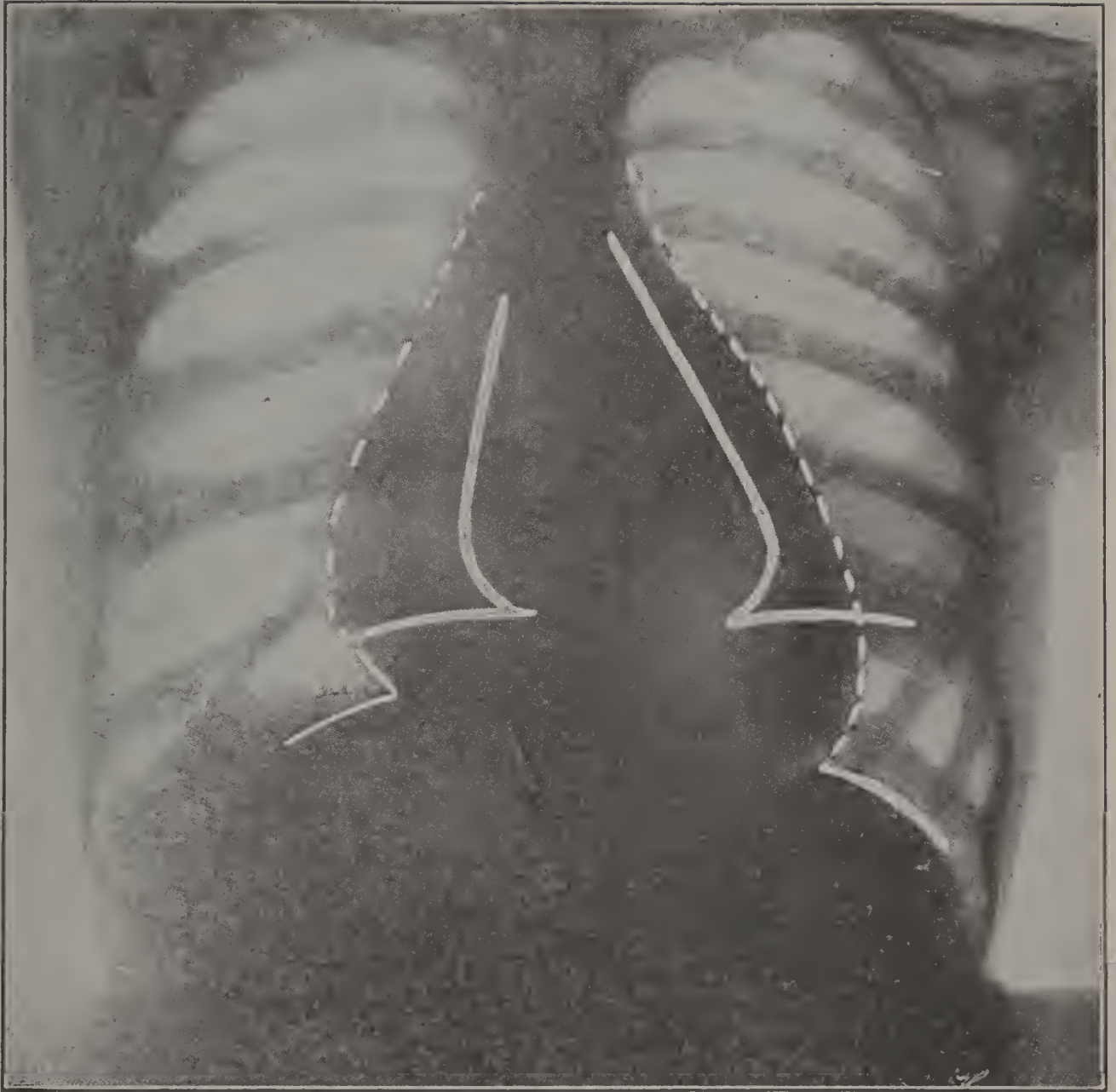


FIG. 4—Observe the condition in advanced cases of mitral insufficiency. Reproduced by courtesy of P. Blakiston and Sons, from *Medical Diagnosis*, Green. White lines by author.

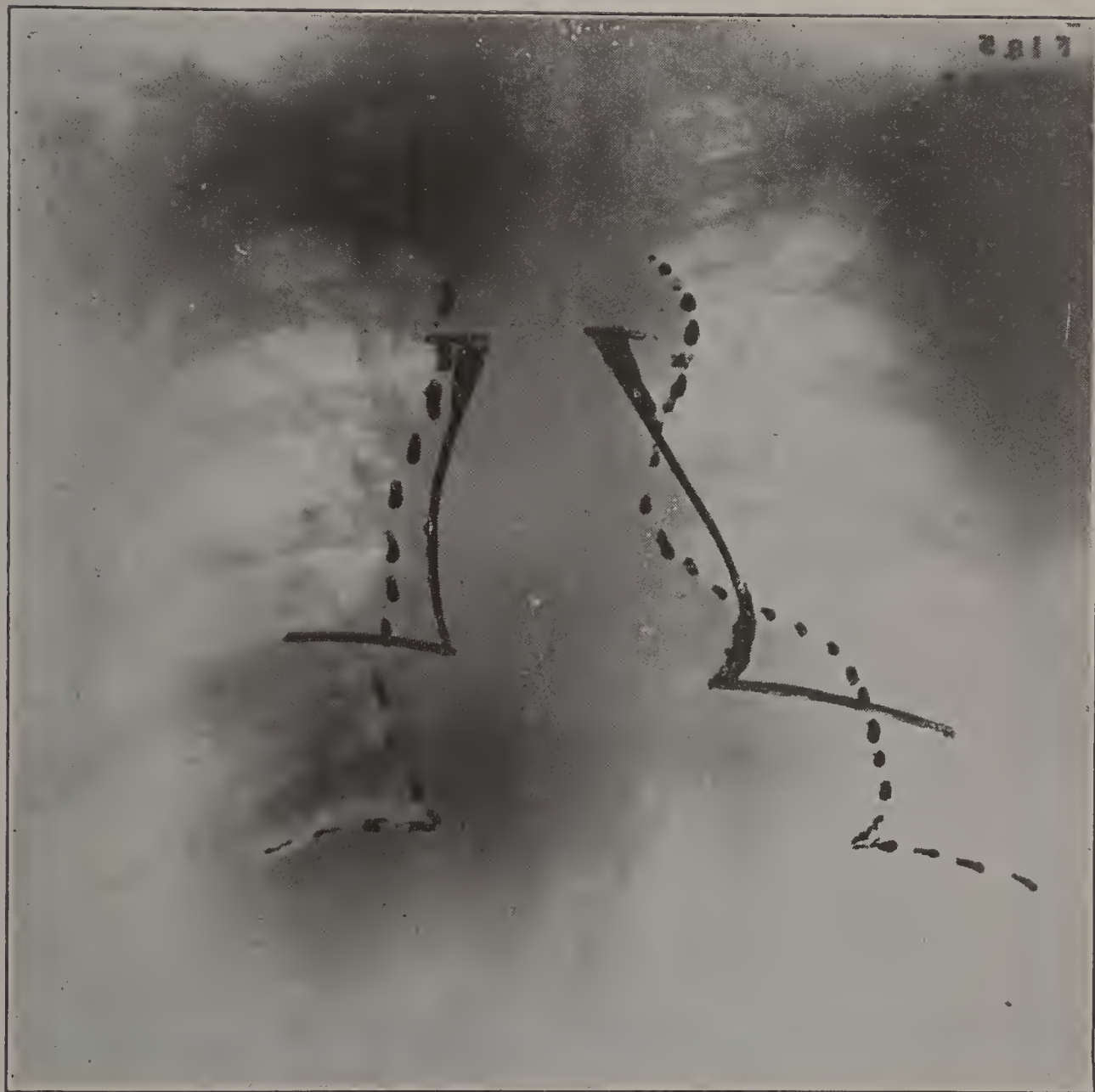


FIG. 5—Male, age 61.

Radiograph taken during forced inspiration.

History of long standing focal infections of tonsils and peridental tissues. Gave history of attacks of angina pectoris. Examination, including electrocardiographic examination by Dr. Stanley Granger found condition favorable for this condition. No cardiac murmurs. Blood pressure, second and third stages reading; Reclining, 110-160, standing 100-160.

Patient later died of angina pectoris.

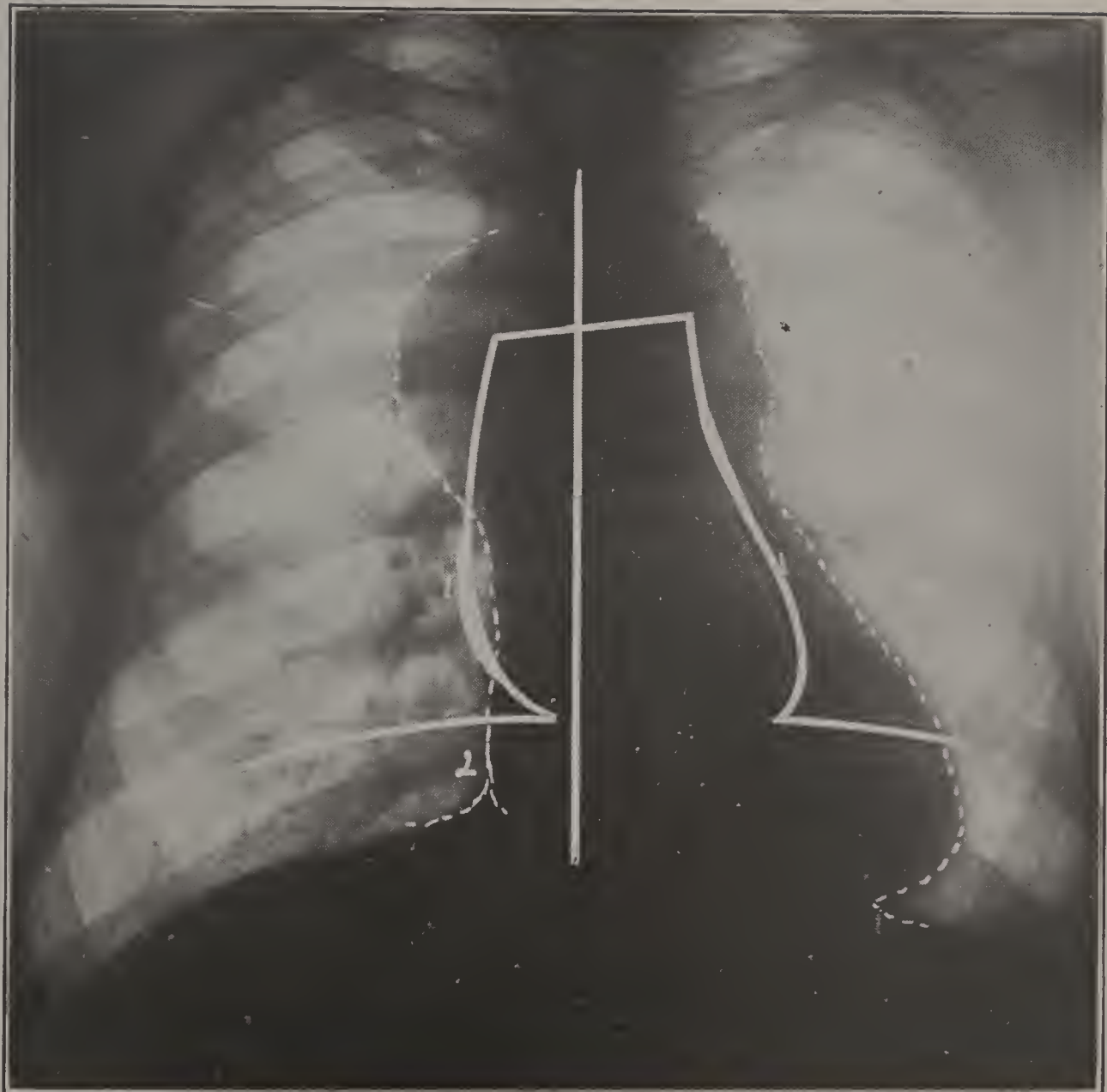


FIG. 6—Male, age 66.

Radiograph taken during full inspiration.

Aneurism of Aorta.

Patient had recently noticed an uneasy sensation in his chest, accompanied by an increasingly annoying spasmodic cough. Physical signs of thoracic aneurism. Blood Wassermann, four plus. Syphilitic aortitis is a frequent cause of aortic aneurism.

worse with the decrease or increase of intensity of focal infections. All persons suffering from chronic focal infections do not suffer from these changes, but certainly many who suffer from this type of myocardial change, without valvular lesions, have foci of chronic infections of the nasal cavities and accessory sinuses, the tonsils or investing tissues of the teeth. These tissues are subject to infection by the same infectious organisms; what may be said of the general results of infection of one tissue may be said of the others.

Hearts suffering from the foregoing described conditions are easily subject to greater or less dilatation through physical stress, with the accompanying unpleasant symptoms. In some of these persons who have been continuously only slightly overworked a slight degree of chronic dilatation occurs; with increasing shortness of breath even to the condition of fainting upon moderately increased exertion.

With relief from infection, rest, and later properly graduated exercise improvement often occurs.

Angina Pectoris

In the few cases of *Angina Pectoris* which I have seen since these observations have been in progress, each has had extensive focal infection with radiographic shadows of the type seen in illustration, without valvular murmurs.

If even a small portion of the cases suffering from the foregoing conditions are due to the foci of infection described, the importance

of the painstaking dentist and nose and throat specialist is emphasized.

**Angina
Pectoris**

is a paroxysmal neurosis, generally associated with disease of the heart and aorta, frequently accompanied by circulatory disturbance, with changes in the coronary arteries, which interferes with cardiac nutrition. It is characterized by acute attacks of agonizing pain in the region of the heart, extending into the neck, down the arms, especially the left, on the inside, with a feeling of impending death. It frequently accompanies fatty muscular degeneration, arterio-sclerosis, syphilitic or chronic streptococcic infections.

The prognosis is grave, many patients finally dying in an attack. Paroxysms and death are often precipitated by excessive exercise or mental excitement. They are poor operative risks and take anesthetics poorly.

OTHER INFECTIOUS
CONDITIONS

OTHER INFECTIOUS CONDITIONS

Infectious Disease

A few of the more important infectious diseases will be considered only in so far as to aid in their recognition, and some of the more important sequelae. According to their appearance in communities infectious diseases may be (1) *Sporadic*, occurring in isolated and scattered cases; (2) *Endemic*, appearing in a number of cases, but confined to certain localities; (3) *Epidemic*, affecting a large number of persons simultaneously and spreading rapidly to other localities.

The results of infections are shown by local or constitutional symptoms or both. The constitutional symptoms usually include those of *fever*, which may be *sthenic* or *asthenic*. *Sthenic Fever* symptoms are a hot, dry, flushed skin, increased pulse and respiration attended by restlessness. There is thirst, digestive disturbance and headache.

Asthenic Fever symptoms are a damp, clammy skin, dry mouth, coated tongue, weak pulse, shallow respiration, stupor or delirium.

Local Symptoms

May include changes in the skin, which may appear as

1. Macules or patches, as a freckle;
2. Papule, a circumscribed elevation, as a pimple;
3. Tubercles or large papules;

4. Vesicles or elevations filled with serous fluid ;
5. Pustules or elevations filled with pus ;
6. Blebs or bullae—elevations of the horny layer and in size much larger than a vesicle. They are filled with a serous fluid.

There are many lesions due to the change of the primary lesion, as scales, crusts, excoriations, fissures, ulcers, scars and pigmentations.

ACUTE INFECTIOUS DISEASES

If persons suffering from acute infectious diseases have come to your office by means of a public conveyance, they should, if possible, be returned by private or special conveyance. Frequently this can be arranged for through the health department.

Scarlet Fever

An acute infectious disease characterized by sore throat and a diffuse scarlet eruption. One attack does not necessarily protect from others.

Etiology

An unknown micro-organism, possibly a modified streptococcus. It may be conveyed by discharges from the mucous membranes, clothing, bedding, books, toys or domestic pets coming in contact with the patient. Scarlet fever may be carried in food, particularly milk.

Pathology

An inflammation of tonsils, pharynx and larynx, which is usually catarrhal, but may be membranous or gangrenous. This process

frequently extends to the nose or ear. Inflammation of the skin of variable intensity, resulting in the death of the epidermis, which is thrown off in the desquamation. There is general hyperplasia of lymphoid tissue. Lesions due to mixed infections may occur in the heart, lungs, liver or spleen.

Incubation

One to seven days.

Symptoms

Soreness of the throat, usually vomiting, rapid pulse, rapid rise of temperature to 104° or 105°, diffuse scarlet rash usually appearing inside of twenty-four hours on the neck and chest and rapidly spreading over the body. The tongue is swollen and coated, with a red margin. Later the tongue is red and rough with prominent papillae—"the strawberry tongue."

**Malignant
Scarlet
Fever**

may occur with a very high fever and hemorrhage into the skin and mucous membranes. Death usually occurs.

Complications

Nephritis, arthritis, endocarditis, pericarditis, myocarditis, pleurisy, otitis media, supuration of lymph glands and changes in the nervous system, such as chorea.

The sudden onset, eruption, throat symptoms, the tongue, and desquamation. It differs from measles in the absence of coryza and buccal spots. Diphtheria told by microscopic examination of throat cultures.

MEASLES

Measles is an acute infectious disease characterized by initial coryza and a rapidly spreading blotchy eruption.

Etiology An unknown micro-organism. Only a short exposure is necessary to communicate the disease and it is most contagious in the catarrhal stage.

Pathology No characteristic lesions. There may be changes in the lungs, kidneys or lymph nodes.

Incubation Usually two weeks.

Symptoms Chilly feeling, coryza, redness of eyes and lids, photophobia, cough, fever from 102° to 104° . The patient may complain of a sore throat and congestion is seen. Buccal spots or Koplik's spots appear as bluish white spots surrounded by red areolae, and are found in the mucous membrane of the cheeks. The eruption begins about the fourth day, usually on the forehead, as small red papules and extends over the body taking the form of crescentic reddish blotches.

Hemorrhagic measles may occur with severe invasion, characterized by hemorrhages on the mucous membranes and usually ending fatally.

Complications Broncho-pneumonia, purulent conjunctivitis, otitis media, enteritis, nephritis, pertusis and tuberculosis.

Diagnosis From scarlet fever by milder onset and blotchy rash. From German measles by care-

ful observation and milder symptoms. From drug eruptions by lack of catarrhal symptoms in the latter.

GERMAN MEASLES' (Rubella)

Rubella is an infectious disease resembling both scarlet fever and measles.

Etiology	Unknown; occurs in epidemics.
Incubation	Ten to twelve days.
Symptoms	Chilliness, slight fever, coryza and macular eruption on the throat. In twenty-four hours it covers the body. The eruption is brighter than measles and less crescentic.
Complications	Are rare.
Diagnosis	By slight constitutional symptoms, little or no fever, color of rash and early enlargement of cervical lymph glands.

SMALL-POX (Variola)

Small-pox is an acute infectious disease characterized by an eruption which is successively papular, vesicular, pustular and crusty, and by a peculiar febrile reaction.

Etiology	An unknown poison in the pustules or crusts. One attack generally confers immunity for life. Severe forms may be contracted from mild forms. The disease is contagious from the beginning, and may be carried by one who is not himself infected.
Pathology	Pustules on the skin which leave a scar only if the true skin has been involved. There

may be a diffuse suppuration of the skin, hemorrhages on skin or mucous membranes and degeneration of spleen, liver or kidneys.

Varieties	<ol style="list-style-type: none">1. Variola.2. Variola hemorrhagica.3. Varioloid.
Incubation	Ten to fourteen days.
Variola Symptoms	Chill, severe pain in lumbar region and in extremities, vomiting, temperature 103° - 104° . An erythematous or macular rash begins on lower abdomen, inner surface of thighs and axillae. There are eruptions of small red papules on the forehead on the fourth day. These spread rapidly over the face, trunk, extremities and mucous membrane, the palms of the hands and soles of the feet. The eruption is most marked on the face. With the eruption the temperature and the constitutional symptoms subside. The papules become vesicles with clear fluid contents and later pustules. With the formation of pustules the temperature rises again and the constitutional symptoms return. The pustules become umbilicated, dry gradually, forming crusts, which fall off, leaving a scar.
Confluent	forms are seen when the papules are confluent and all symptoms are more severe.
Hemorrhagic	Punctate hemorrhages appear on the skin, mouth, internally or into pustules.
Varioloid	Small-pox modified by vaccination. The invasion is sudden and severe, but the pustules are scanty and mature rapidly. There

is an early disappearance of constitutional symptoms.

Complications Edema of the glottis, broncho-pneumonia, pleurisy. Later boils, abscesses, ulcerative eye diseases and otitis media.

Prognosis High mortality to those unprotected by vaccination. Different epidemics differ greatly in virulence. A mild epidemic may suddenly become very virulent.

Diagnosis Characteristic eruption and severe constitutional symptoms. An eruption on palms of hands and soles of feet during course of an acute disease is of great diagnostic importance.

Small-pox may be almost entirely eliminated by vaccination.

VARICELLA (Chicken Pox)

Chicken Pox is an acute infectious disease characterized by a vesicular eruption.

Etiology Unknown cause. Is not related to small-pox.

Incubation Ten to fifteen days.

Symptoms Slight fever, chilly sensation, pain in back and extremities. The eruption appears in twenty-four hours as papules. These soon become vesicles and then pustules. The eruption appears in successive crops on trunk or face, and all stages of development are often seen at once.

Complications are rare.

Diagnosis The symptoms are less severe than small-pox, the fever runs a different course, and the eruption is in crops. Severe cases may be difficult to differentiate from small-pox.

WHOOPING COUGH (Pertussis)

Pertussis is an infectious disease characterized by a paroxysmal cough followed by a deep sonorous inspiration, the "whoop."

Etiology The exciting cause is the *bacillus pertussis*, found in the sputum. The disease is epidemic and often associated with other epidemics, one of which is measles.

Pathology No characteristic lesions.

Incubation Seven to ten days.

Symptoms It begins with catarrhal symptoms, which last about ten days. The cough gradually becomes worse until a paroxysmal stage with the "whoop" is developed, which frequently continues for several weeks. The attack consists of a number of forceful expiratory coughs, followed by a long inspiration through the contracted glottis, which causes the shrill whoop. During the attack the face is cyanotic and the paroxysm may end in vomiting. There is a marked lymphocytosis.

Complications and Sequelae Hemorrhages into the skin, mucous membrane, conjunctiva or brain; broncho-pneumonia, emphysema and tuberculosis.

Diagnosis The "whoop" is characteristic.

MUMPS OR EPIDEMIC PAROTITIS

Mumps is an acute infectious disease characterized by an inflammation of one or both parotid glands, or of the testis, or ovaries or breasts.

Etiology Unknown.

Incubation Two or three weeks.

Symptoms The onset is with slight fever and pain below the ear, swelling of the parotid gland and difficulty in swallowing. Other salivary glands may be involved. Severe constitutional symptoms are rare.

Complications and Sequelae Orchitis is common in the adult male. Ovaritis and mastitis may occur in women.

Diagnosis The swelling of mumps may be differentiated from the swelling of cervical lymph nodes by the fact that the swelling of the parotid gland is in front of and behind the ear, the lobe of which is raised and everted.

ACUTE POLIOMYELITIS—(Infantile Paralysis)

Infantile Paralysis is an acute epidemic or sporadic infection involving the anterior horns of the spinal cord.

Etiology A micro-organism transmitted through the secretions of an infected person's nose and throat and probably through "carriers" who are themselves immune. Children from one to five years old are most often attacked.

Pathology Inflammation in the anterior horns of the spinal cord or higher nerve centers which may go on to degenerative changes.

Incubation Two to fourteen days.

Symptoms Fever, digestive disturbances, listlessness, drowsiness; there may be retention of urine and sensitiveness of the skin, or the child may suddenly awake with paralysis, which is frequently permanent.

Diagnosis By the presence of an epidemic. Paralysis accompanying the above symptoms. Lumbar puncture.

Isolation of patients and hearty co-operation with the health authorities is necessary for the control of Acute Poliomyelitis.

TYPHOID FEVER

Typhoid fever is an infectious disease characterized by hyperplasia and ulceration of the intestinal lymph nodes.

Etiology It is caused by the bacillus typhosus, introduced into the intestinal canal by contaminated drinking water, milk, ice or other food. It is carried by flies, on the hands, dishes, etc.

Typhoid fever is not a disease that the dentist will be called upon to diagnose, but is one of the many diseases to which he must give his attention both as a citizen and as a medical specialist. He should help in matters of education and in laws controlling drinking water, food supplies and in the care of the contagious individual.

Typhoid fever can be controled by either sanitation or vaccination. Vaccination should be administered to persons going into places where there is doubt as regards the sanitary conditions. Also by those who have the care of typhoid patients.

TYPHUS FEVER

Typhus fever is an acute infectious disease characterized by a severe general toxemia. It is transmitted by the bite of the body louse. The disease is found in insanitary camps, jails and ships. It is occasionally brought into California from Mexico. At various times in the history of the world this disease has been epidemic, but modern hygiene has it under control in all enlightened communities.

PLAGUE

Black Plague

By the term "Plague," when not qualified, or by the terms "Black Plague," is meant an acute infectious disease which occurs in two forms:

- a. Bubonic Plague.
- b. Pneumonic Plague.

The more common form is bubonic plague, which is manifested by symptoms common to severe, acute infectious diseases, such symptoms being high fever, great prostration, accompanied by inflammation and swelling of the lymph nodes, which may easily be felt in the axilla, groin and neck. The disease runs a

rapidly fatal course in the large majority of cases.

Pneumonic plague develops in the lungs, and shows symptoms of a very acute pneumonia, which is fatal in from two to five days in the majority of cases.

Both forms of plague are due to the same organism—the bacillus pestis, the difference in the two forms being whether or not the lungs become infected.

Plague is a disease of rodents, the two of greatest importance to the human family being the rat, which is very susceptible to the disease, and the ground squirrel, which comes near enough to the dwelling of man to be in intimate contact with the rat, infecting it with the plague. The rat in turn carries the disease to the abode of man. Thus the ground squirrel is a real source of danger to man.

Plague is transmitted to man from the rodent by means of a species of flea which lives on rodents, and most frequently on rats. When the animal dies of plague, the fleas leave the dead body, carrying with them some of the blood of the animal, and a man bitten by such fleas becomes inoculated with the germs of the disease, providing the site of the bite is scratched.

This most frequently produces bubonic plague, which is not transmitted direct from man to man, but only through the medium of the germ-laden flea, because the plague bacilli are not thrown off—an open sore is

not formed. However, if the disease attacks the lungs, producing pneumonic plague, the bacilli are thrown off in the expectoration and are received by those who come in contact with them, and such persons develop pneumonic plague, which spreads very rapidly.

Plague was probably first introduced into the United States in 1898 from the Hawaiian Islands by infected rats carried in ships into San Francisco. (Kellogg, Journal American Association, May 10, 1900.) Following this, sporadic cases among men and rats developed, most frequently in the bay district.

In August, 1919, in Oakland, a case of bubonic plague was reported, which later developed into pneumonic plague. From this one case twelve contacts developed pneumonic plague, making a total of thirteen cases, of which twelve died. (Kellogg, American Journal of Public Health, July 20, 1920.)

This is the first pneumonic plague known to have occurred in the United States. Prompt measures were taken and the disease was brought under control. Had it not been promptly checked, we cannot estimate what the result might have been.

Contrast the above mentioned situation with conditions in Manchuria, where pneumonic plague developed during the winter of 1910-1911. Fifty thousand persons died within three months. Our papers related the horrors, the burning of bodies in the streets, it being impossible to dispose of them in any

other manner. This has been related to the writer by an eye witness.

Plague has more recently appeared in some of the southern ports of the United States.

Rat extermination is the keynote to the control of the disease, and added to our problem is also the extermination of the ground squirrel, in order to insure security from this menace to humanity. To bring this about we must maintain and earnestly cooperate with our Department of Health. A district in which infection has become extensive among the rodents will probably be continuously infected and will require the service of competent health authorities.

RABIES—Hydrophobia

An acute infectious disease transmitted most frequently to man by the bite of rabid animals, more frequently the dog.

Infection The infection is in the negri bodies, which are found in the nerve cells of the central nervous system.

Incubation Period The incubation period varies greatly from a few days to several months. The period of incubation is apt to be shorter, and the symptoms more severe, the nearer the head the wound occurs. The earlier symptoms are irritation at site of wound, anxiety, headache, irritability, and other symptoms common to acute inflammation of the central nervous system, terminating in spasms most distressing in character, which terminate in death.

Prophylactic Treatment A person being bitten, the wound should be excised, or if possible a ligature may be applied above the wound. Nitric acid should be applied as soon as possible and the wound thoroughly cauterized. (Carbolic and other acids are less effective.) This may be followed by the application of a solution of Sodium Bicarbonate (saturated), washed in sterile water and a dry dressing applied.

Disposition of Suspected Animals The animal inflicting the bite may be kept for two weeks and if at the end of that time it has remained well, it was not rabid. If symptoms develop the animal should be killed, and its head sent to a laboratory for examination.

Treatment of Persons Bitten If there is reason to believe that the animal was rabid the Pastuer treatment should be employed by the person bitten as soon as possible.

Prognosis Of persons bitten by rabid animals probably less than one-half develop the disease, even though not treated. There is less danger if bitten through the clothing and the farther from the head the less the danger. When symptoms develop death is considered inevitable, if it is a true case of rabies.

Hysterical or pseudo-hydrophobia sometimes occurs.

Prophylactic Measures Muzzling and other proper restraint of dogs has proven a most efficient prophylactic measure.

Within the past few years Anti-Rabic Virus

**Use of Anti-
Rabic Virus
Prophylac-
tically for
Dogs**

**Endorsement
by California
State Board
of Health**

**Rabies
Among
Wild
Animals**

**Control by
Cooperation
With Health
Authorities**

**Example of
the Spread
of Rabies**

has been used prophylactically for the protection of dogs from rabies: the protection is said to last for one year. The California State Board of Health, October 7, 1922, approved this method by incorporating it in Rule 7A and recommending its use. They inform us through their Bulletin, that control of the dog population, preferably by vaccination against rabies, together with the destruction of all unvaccinated dogs, will eliminate this truly terrible disease. Coyotes and other wild animals are subject to this disease and may introduce it among domestic animals, from time to time.

Rabies, like other endemic diseases spreads through communities in progressive waves, or periods of greater or less prevalence and intensity, according to the character of the disease. These may be controlled according to our knowledge of the causative factors and the co-operation of the people with competent health authorities. Rabies is one of the diseases which can be almost entirely prevented and readily controlled, by measures previously discussed.

As an example of the spread of the disease when the health authorities lack proper co-operation the following summary of statistics of the animal and human rabies in California during the past three years, compiled from the records of the State Board of Health, is of interest. Where co-operation has been lacking the prevalence of the disease has the

more markedly increased. Each case, whether animal or human, is also the record of a death; recovery after symptoms are manifest does not occur; death from rabies is one of the most horrible forms of death.

During the year 1921 cases of rabies were reported from twenty counties in California. During the years 1922 and 1923 to December 15th, reports of cases have been received from twelve additional counties.

During the years 1922 and 1923, to December 15th, there have been recorded 695 persons who have been bitten by rabid animals and who have received anti-rabic treatment at the public laboratories and Los Angeles General Hospital. The number treated by private physicians I do not know.

**Protect
Against
Rabies**

If you love your dog have it protected. If you love your family have your dog protected. If you do your best to protect your dog and family, you will aid in the protection of the community.

No health department is stronger than the expressed sentiment of the community will permit it to be. It will be your privilege as dentists to do your part toward educating those with whom you come in contact, in regard to public health measures, and to support scientific health legislation and enforcement.

Tables showing the progress of rabies in California and in Los Angeles County and City during the years 1921, 1922 and 1923 to December 15th.

	1921			1922			1923 (to Dec. 15)			For 3 years		
	Total	Hu- man	Ani- mal	Total	Hu- man	Ani- mal	Total	Hu- man	Ani- mal	Total	Hu- man	Ani- mal
State	113	5	108	567	4	563	1017	10	1007	1697	19	1678
Los Angeles Co.	67	1	66	427	4	423	790	7	783	1284	12	1272
Remainder of California	46	4	42	140	0	140	247	3	244	413	7	406
Los Angeles City										575	6	569
Los Angeles Co.												
Outside of L. A. City										215	1	214

SOME COMMON DISEASES OF THE SKIN

Scabies A contagious disease of the skin caused by a small animal parasite which burrows into the skin. It is seen between the fingers, on the tender surfaces, as the inner side of forearm, and about the genitalia.

Impetigo Contagiosa An acute inflammatory contagious disease of the skin characterized by superficial vesicopustules. It is seen principally on the scalp, face and hands. It is an unknown micro-organism.

Ring Worm (*Tinea Trichophytina*) is a contagious disease of the skin caused by a vegetable parasite. It may affect the body, the scalp or the beard.

Favus A contagious disease of the skin due to a vegetable parasite. It is usually seen on the scalp and appears as a crust under which is pus and scaling skin.

Erysipelas An acute infectious disease of the skin caused by a streptococcus. It appears as sharply defined areas of redness. It is very dangerous if it comes in contact with open wounds.

CANCER

CANCER

Mortality

The death rate from cancer is increasing. This disease is now the subject of organized study which in the United States has found expression in the organization of The American Society for the Control of Cancer. The basic principle of this organization for the Control of Cancer is, Cancer is a Curable Disease if Recognized and Treated in the Early Stages.

From their reports the following conclusions may be drawn:

Cancer is one of the most important causes of death. It is now the cause of at least 90,000 deaths annually in the United States.

The recorded cancer death rate is increasing in every country. In the United States it has risen from 62.9 per 100,000 of population in 1900 to 81.6 in 1917.

A large percentage of these deaths from cancer could be prevented if both the public and the medical profession were fully educated in what they each ought to know about the disease and if they would seek treatment at the first appearance of danger signals.

Curability

Cancer is curable because it is believed not to be a "constitutional" or "blood disease," but always at first to be a local disease beginning in a single small spot. While it is still confined to the place where it begins it usually can be entirely removed from the body by competent treatment.

It has been thought that cancer is due to a specific organism. Much work has been done to prove this to be true, but up to the present time such efforts have failed. What may be discovered, I cannot predict. It is incumbent that we use the knowledge at hand to the best of our ability.

**Pathological
Development**

Cancer is believed to be a lawless growth of body cells, which take on an abnormally rapid growth, and which destroys life if allowed to run its course. The abnormal growth thus started continues until surrounding tissues are invaded. Eventually part of the original growth may break off and be carried in the blood or lymph vessels to other parts of the body, where it starts secondary growths that lead to the common but erroneous belief that cancer is a constitutional or blood disease. From this description it is apparent that cancer, when it first begins, is a purely local growth and therefore removable and curable. There is a danger of spreading by manipulation, rubbing, or the application of irritants.

**Avoid
Irritation**

Cancer arises after long-continued irritation of various kinds and in or about benign growth or ulcerations.

Persistent ulcerations, cracks and sores, warts, moles or birthmarks, which change in appearance or grow larger, should be removed, and tissues subjected to irritation kept under intelligent observation.

After cancer has actually developed, it is in

many cases still curable, but there must be no delay. The possibility of curing cancer by operation is much greater than most people realize.

Cancer of the Lip

Cancer of the lip and mouth may arise from pipe smoking, bad teeth, the carrying of pencils, nails, or other irritant substances in the mouth.

Cancer of the Tongue

Excessive smoking, syphilis, and broken teeth are important causative factors. Numerous cases have been traced to badly fitting or broken dental plates. Smoking, as a form of chemical irritation, produces a chronic inflammation of the tongue and the formation of small fissures or ulcers. Any ulceration of the tongue that does not quickly respond to treatment should be considered malignant until it is proved otherwise. Cancer of the tongue spreads rapidly and the operation is severe and dangerous, and only if the case is seen early and promptly treated is there a fair chance for a permanent cure. Nitrate of silver or other caustics must not be applied to irritative ulcers of the tongue. Such treatment in a case of unrecognized cancer will stimulate the malignant growth. What has been said of the tongue is true of the other tissues of the mouth.

Heredity

The existence of cancer families, an argument sometimes brought forward as evidence of hereditary influences, does not afford definite proof of the general inheritability of this disease, for such families are not very

frequent and the occurrence of a considerable number of cases in a given family can be explained as a purely accidental occurrence. At the present time the only verdict that can be furnished it "not proven." The thought of heredity should not lead to worry, for cancer to a certain extent goes hand in hand with longevity.

**Summary
and
Conclusion**

(a) The ravages of this disease can be diminished by the dissemination of knowledge leading to its early recognition by the patient and physician. The American Society for the Control of Cancer, the various medical societies, boards of health, insurance companies, women's clubs and other agencies are endeavoring to bring to the people the message of hope that cancer is curable in the majority of cases if treated early. These facts are being established by the work of research laboratories and hospitals and the improving of statistics of clinics, insurance companies and public authorities.

(b) The following points should be especially remembered:

- (1) Cancer is not a "blood disease" but always starts as a local affair. Hence it can always be cured by removal if discovered and treated early enough.
- (2) Cancer in the beginning may cause no pain or other symptoms of ill health.
- (3) Cancer is probably not hereditary.
- (4) Contagiousness of cancer has not been demonstrated.

- (5) No treatment should be applied to a condition that might develop into a cancer without thorough examination.
- (6) The cancer patient must learn to seek treatment promptly.

DISEASES OF
METABOLISM

DIABETES MELLITUS
DIABETES INSIPIDUS
SCURVY

DISEASES OF METABOLISM

Vitamines

Vitamines are substances, other than protein, carbohydrate and fat, which are found in certain plant and animal tissue, and which are indispensable to the normal life processes. They have never been isolated. The field is almost unexplored, but certain it is that they are factors, in all diets, that are directly related to health. We do not know as yet the exact nature of an enzyme or a toxin or anti-toxin. No medical man ever doubts their existence, and although we do not know their exact nature yet we use them therapeutically. So also with vitamins. We have no exact knowledge, but we use what is known while untiring investigators continue the search.

Some forty years ago, beri-beri (a disease of the Orient) was found to be associated with a faulty diet. The disease was at last produced in animals by feeding them on an exclusive diet of polished rice. Later the substance extracted in polishing the rice was given the animal and a cure resulted. In 1911 it was thought the active principal had been isolated and that it was a substance showing the characteristics of an amine. Accordingly, as it seemed so vital to life, it was called vita-amine. Later studies proved the isolation wrong, but the name remained and is applied to the new field of study.

It is known that a substance rich in one vitamine does not contain another. Thus cod liver oil and butter fat possess the fat soluble vitamine while they do not possess the vitamins found in yeast, and neither of them possess certain others found in orange juice. Again these vitamins may be found in the fresh stage and be destroyed by cooking.

The average family under our normal economic conditions is not in danger of beri-beri or scurvy. There is, however, a tendency on the part of the manufacturer to refine away many of the food products to such a degree that the vitamins are either partially or totally removed. The public demands what is pleasing to the eye and palate, and what can be prepared with the least time and money. The result is that in a land of plenty there is more malnutrition than should be found. With the variety of foods available for the American table, it is possible to adjust the selection so that all vitamins and other nutrients are present.

With the sick who have a poor or perverted appetite and abnormal digestive and assimilative powers, a careful study has to be made of the food.

DIABETES MELLITUS

Definition A nutritional disorder characterized by an excess of sugar in the blood and its persistent excretion in the urine, which is much increased.

Pathology	The blood contains an excess of sugar and fat globules.
Symptoms	The invasion is usually gradual. Urine is passed frequently, six to forty pints in twenty-four hours; is pale, with a specific gravity of 1025 to 1045 (sometimes lower with chronic nephritis); contains 1 to 10 per cent of glucose, often acetone, diacetic acid—also oxybutyric acid during coma. There are abnormal thirst and appetite, often loss of weight and strength, sometimes constipation, headache and depression. The mouth is dry, the tongue red and glazed and the skin dry. Progress is more rapid the younger the patient. Death usually occurs in diabetic coma; in others it results from complications.
Complications	Frequently boils and carbuncles, lobar or broncho-pneumonia, pulmonary tuberculosis, gangrene or perforating ulcer of the foot, and indolent ulcers of the plantar surfaces of the toes.
Diagnosis	By persistence of glucose in the urine, which is usually of high specific gravity (Fehling's and Benedict's solutions, and Purdy's solution for quantitative test).
Prognosis	Recovery has been rare until the recent discovery of insulin. In patients under forty years the outlook is worse; in those over forty the progress is slow and the symptoms are milder. Resistance to bacterial infection is low; wounds heal poorly and extensive ulceration is liable to follow operative procedure.

Insulin

One of the most brilliant advances in therapeutics of recent years was announced in March, 1922, in the Canadian Medical Journal by Banting, Best, Collip, Campbell and Fletcher in which they reported the successful use of *insulin* in seven cases of diabetes mellitus. Their observations have been corroborated since that time by many physicians throughout Canada, the United States and Europe.

Insulin is an extract of the pancreas which contains the active principle of the Islands of Langerhans.

If properly administered, it will enable the diabetic to continue his ordinary vocation. By its use the diabetic may be put into such condition that he will be an average good surgical risk. Diabetics who have reached the state of coma may by its use be restored to consciousness within a few hours, and later to useful life.

DIABETES INSIPIDUS

Definition A chronic disease characterized by the persistent passage of large quantities of urine of low specific gravity.

Etiology Most often in young males. Probably of nervous origin. Syphilis is often present.

Symptoms The onset is usually gradual. The urine is pale, ten to twenty quarts per day, specific gravity 1001 to 1005, total solids often normal. There is thirst, dryness of the mouth

and skin. Appetite and general condition are usually normal, sometimes there is feebleness and emaciation. Death may occur from intercurrent disease.

**Differential
Diagnosis**

From diabetes mellitus, which is of greatest importance, by the low specific gravity of the urine and absence of sugar.

SCURVY

Scurvy

is a metabolic disorder characterized by weakness, anemia, *sponginess of the gums* and tendency to hemorrhage.

Etiology

Prolonged diet lacking in the vitamins that are found in fresh vegetables, fruits and certain animal fats.

Pathology

The gums are swollen and sometimes ulcerated; there are small hemorrhages in the skin, mucous and serous membranes, muscles, etc., and albuminous degeneration in the heart, liver and kidneys.

Symptoms

A gradual onset of weakness and anemia, the gums are spongy and bleed easily, the teeth loosen, there are hemorrhages in the skin, the appetite is poor, the heart action weak, there is general depression and headache.

Diagnosis

There is a history of foods deficient in variety, bleeding of the gums is present and general debility.

Such patients are poor operative risks.

MISCELLANEOUS

Alcoholism

Opium

Cocaine

Hyperthyroidism

Thymus Disease—Status Lymphaticus

MISCELLANEOUS

Hyper- thyroidism

A disease due to increased activity of the thyroid gland. In typical cases there is appreciable enlargement of this gland, accompanied by increased metabolism, prominence of the eyeballs, rapid pulse, fine muscular tremors, with marked irritability. The patients are frequently under weight. The fine muscular tremor is readily observed if the eyelids are closed, and also by forcibly extending the fingers and spreading them wide apart. *Progressive cardiac weakness may develop and sudden death follow a moderate shock. Such cases are unfavorable for operative procedure.*

Hyperthyroidism may result from infection of the investing tissues of the teeth.

Status Lymphaticus —Thymus Disease

(Thymus Hyperplasia). These conditions are recognized by some authors as the same condition; by others as a different disease. Status lymphaticus is a diseased condition characterized by coincident hyperplasia of the lymph nodes, the tonsils, adenoids, spleen, and at times of the heart and arteries, also the thymus gland. There is a great tendency to sudden death, more especially during early life, although the tendency may continue into adult life. *It is of especial importance in relation to deaths accompanying minor operations and anesthesia, the cause of death not being definitely known. Dilatation of the left*

ventricle of the heart has been reported in some cases.

**Thymus
Hyperplasia**

Thymus hyperplasia is considered by some to occur as a more prominent and independent factor than suggested by the above. The thymus gland may be enlarged from two to four times its normal size, giving an area of marked dullness over the manubrium, on percussion; if the lower border rises with extension of the head and falls with flexion, it is quite suggestive of enlargement of the thymus, and this probability is increased if dyspnea is induced by throwing the head back, thus bringing pressure on the trachea.

A history of unexplained suffocative dyspnea and cyanosis occurring in babies and young children should place the physician on his guard, and these conditions demand most careful observation and radiography. *It is of great importance in its relationship to sudden deaths in children and young adults not only without apparent cause, but in connection with operative or therapeutic procedures, the so-called "thymic death."*

**Alcoholism
(Acute and
Chronic)**

(Acute and Chronic). The face in alcoholism is red, the capillaries are dilated, the eyes watery, and the conjunctivae congested. In the chronic form there is cirrhosis of the liver, tremor of hand or tongue, sometimes neuritis or paralysis. Arterio-Sclerosis and cardiac dilatation are common. *Alcoholics are not good operative cases as they do not stand*

shock, and are predisposed to post-operative pneumonia.

**Opium
Habit—
Morphine,
Heroin,**

One of the appalling things before the medical world today is the increase in the number of habitues. The habit is acquired by repeated uses of the drug. More than half of the users have been taught to use it by an addict.

The user after taking the drug has an immediate feeling of well being. This is followed by weariness and sometimes nausea. These symptoms are relieved by repeating the dose. Eventually the person becomes thin, sallow complexioned with pupils dilated or irregular (except after immediate taking of the drug), the appetite is poor, there is sometimes itching of the skin, restlessness, irritability and a tendency to moral deterioration, and in particular to untruthfulness. The withdrawal of the drug after the habit has been acquired is accompanied by most intense suffering.

The use of opiates should be avoided excepting under the most urgent need, during an emergency, and should never be given for several days consecutively.

Cocaine

What has been stated regarding the baneful effects of opiates is equally true of the use of cocaine. It is a habit-forming drug which undermines the physical and mental health of the user and should be used only when necessary and with the greatest caution.

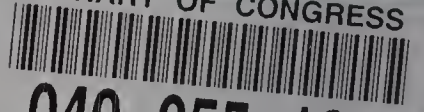
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